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Kelly Lake to Cheekye Substation
Second 500 kV Transmission Line

Public Consultation Report
Phases 1 & 2

Appendices - Volume I

Submitted to:
B.C. Hydro
April 1991

Canadian Cataloguing in Publication Data
Synergistics Consulting Limited
Kelly Lake to Cheekye Substation second 500 kV transmission line public consultation report phases 1 & 2

Contents: [v.2]. Appendices, vol. 1
ISBN 0-7726-1332-X (v.2)

1. Electric lines - British Columbia - Squamish-Lillooet - Public opinion. 2. Electric power transmission - British Columbia - Squamish-Lillooet-Public opinion. I. B.C. Hydro. II. Title.

TK3144.S96 1991 621.319'13 C91-092152-0

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91-06897/

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Synergistics Consulting Limited
Élaboration synergie limitée
TORONTO • OTTAWA • VANCOUVER

Suite 400-12 Water Street
Vancouver, B.C. V6B 1A5
Telephone (604) 684-7760
Fax (604) 681-3546

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VOLUME ONE

A. TERMS OF REFERENCE

1. Terms of Reference: Phase 1
2. Terms of Reference: Phase 2

Terms of Reference - Phase 1

The terms of reference for the Phase 1 Kelly Lake-Cheekye public consultation program were developed by Synergistics Consulting Limited in a proposal to B.C. Hydro, dated March 17, 1989, which was subsequently accepted. The following text is taken from the proposal.

3.0 Goals and Objectives

B.C. Hydro is investigating the option of constructing the Kelly Lake to Cheekye transmission line in response to increased load demand in the Lower Mainland and on Vancouver Island.

A community-based consultation program is being planned for the communities stretching between Clinton and Squamish. The objectives of this consultation program are:

1. To foster broad-based understanding of the need for the transmission line and project planning process.

2. To provide on-going opportunities for residents in affected communities and B.C. Hydro to exchange information and views.

3. To stimulate public discussion of alternative routes and siting options.

4. To achieve some measure of consensus regarding appropriate mitigation strategies.

5. To demonstrate B.C. Hydro's commitment to responding to community concerns in an open, honest and straightforward manner.

Terms of Reference - Phase 2

The terms of reference for the Phase 2 Kelly Lake-Cheekye public consultation program were developed by B.C. Hydro in April 1990. The following pages outline the terms of reference.

KELLY LAKE - CHEEKYE 500 kV TRANSMISSION LINE
PUBLIC CONSULTATION PROGRAM
PHASE 2 - TERMS OF REFERENCE

1. INTRODUCTION

This work concerns Phase 2 of the public consultations' for the proposal by B.C. Hydro for a second 500 Kv transmission line (known as 5L46) from Kelly Lake substation near Clinton, to Cheekye substation, near Squamish, and removal of the existing 230 kV line (2L1) from Shalalth to Cheekye. Hydro has completed the first phase of these consultations, the results of which are contained in the Phase 1 report. Hydro is now undertaking the second phase of the consultation program.

2. OBJECTIVES

The overall goal of the second phase of the Kelly Lake-Cheekye public consultation program is to complete the process of identifying and addressing issues of concern to the public and incorporating them into project planning. The objectives of this phase are:

a. to report back to those communities, interest groups and individuals in the study area in order to inform them of the results of the first phase of consultation and obtain their views about the proposed consensus route;

b. to continue consultations with the Municipal, Regional and Provincial Governments in the study area and assist in the work of the Advisory Group to the Regional District as required aid in the effort to obtain a consensus on the appropriate siting for the Whistler route;

c. to consult with the Native bands, in the study area;

d. to continue demonstrating B.C. Hydro's commitment to meaningful, open consultations with the public.

3. CONSULTANT SERVICES

3.1 B.C. Hydro requires the services of a public consultation consultant to assist with Phase 2 of the public consultation program, as outlined below.

3.2 Public Consultation Forums:

(a) Meeting arrangements: With the exception of the items listed in 3.2(c), the consultant shall make the necessary arrangements for meetings between members of Hydro's project team and the individuals, groups and communities listed in 3.2(d). These arrangements shall include scheduling venues, accommodation, equipment and facilities, transportation, refreshments and assisting in arranging for advance publicity.

(b) Internal Project Team and External Relations Project Team Meeting: Consultant should be available to attend these meetings and document any action and follow up resulting from them.

(c) Attending and reporting: Except as otherwise agreed by B.C. Hydro, the consultant will attend all of the meetings listed in 3.2(e), and will compile and maintain complete reports on them. These reports will include full details on the attendees and on the comments and questions made and any follow up required. The consultant will prepare notes of all the meetings.

(d) Materials provided by Hydro: B.C. Hydro will prepare a newsletter which is to be released prior to any public forums. Copies of this newsletter will be available at the meetings. In addition, Hydro will be responsible for the preparation of any audio-visual materials, display panels or written hand-outs which may be needed for the meeting.

(e) Meetings to be arranged: Meetings shall be arranged in the following municipalities with the groups listed:

Open Houses shall be held during the hours of 15:00-21:00 for the general public.

Note: Additional meetings with Community groups identified through the Phase 2 public consultation program as required.

Clinton: Municipal Council; B.C. Hydro employees in the Cache Creek District office; open house for the community at large.

Pemberton: Municipal Council; open house for the community at large.

Shalalth/Seton: B.C. Hydro employees; open house for the community at large.

Lillooet: Municipal Council; Squamish-Lillooet Regional District; B.C. Hydro employees; open house for the community at large.

Whistler: Municipal Council; open house for the community at large; Advisory Group involvement as required.

Birken: Open house for the community at large.

Other Locations: As requested or arranged with interest groups.

3.5 Schedule (as amended)

The public consultation meetings in this project shall be held between May 27, 1990 and December, 1990, or as soon as possible thereafter, but, in any case, not later than June 24, 1990. Every effort shall be made to ensure that all meetings in a particular community are scheduled on the same day. The consultant shall submit the final report on Phase 2 public consultation by 30 January 1991.

3.6 Budget

The budget for the consultant's part of Phase 2 shall be as agreed between B.C. Hydro and the consultant.

3.7 Terms and Conditions

These Terms of Reference shall be interpreted and carried out in line with the terms of the enclosed document, "CONDITIONS FOR CONSULTANT SERVICES".2

VOLUME ONE

B. PUBLIC INFORMATION MATERIALS

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3. Project Prospectus (September 1989)
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BC hydro

Kelly Lake-Cheekye Transmission Line

PROJECT NEWSLETTER

Community Issues

During initial discussions with local residents the following issues were identified:

- Electric and magnetic fields
- Vegetation management
- Property purchase/lease
- Justification for the project
- Visual impacts
- Intrusion into wilderness areas
- Land use and property issues, including native lands

These issues and any others that emerge will be fully considered and evaluated in the ongoing public consultation process.

B.C. Hydro studies new transmission line

B.C. Hydro has begun studies for a second 500 kV transmission line from Kelly Lake substation near Clinton to Cheekye substation near Squamish - a straight line distance of some 200 kms. Recent studies show that this new line could be needed to meet future electricity demand in the Lower Mainland and on Vancouver Island in the mid to late 1990s.

B.C. Hydro is undertaking detailed environmental studies and will be meeting with interested individuals and groups throughout the project planning phase. B.C. Hydro will be exploring ways of maximizing potential benefits and minimizing negative impacts.

This newsletter will be published throughout the project to keep you up to date. B.C. Hydro invites your letters, articles and questions, and they will be published as space permits.

Environmental studies are underway to assess route alternatives.

Planning for the future

by L. Bell

All of us in British Columbia are faced with choices about our energy requirements for the 1990s and the 21st Century. The annual demand for electricity in the B.C. Hydro system could increase substantially in the next two decades even with our best conservation efforts.

Why? Because economic growth in the province is directly related to the use of electricity. On average, from 1961 to 1987, the province's energy needs grew at a rate of 1.2 per cent for every 1 per cent growth in the Gross Provincial Domestic Product.

During the early 1980s, while B.C. suffered under a major economic recession, the province faced a surplus of energy and we were able to postpone energy decisions for the future.

That is no longer the case. In 1988, for the third consecutive year, demand for electricity in the province exceeded load forecasts for the B.C. Hydro system, and this demand is expected to grow. While the growth is uncertain, current estimates suggest that in the coming years through 1998 the average economic growth rate may be 3 per cent per year. For the next 10 years after that, the province's economy may grow by at least 2.8 per cent, or more per year.

How will we meet this additional demand for electricity? Unfortunately there are no easy answers. In our Resource Plan we've tried to identify alternatives and solutions that will both meet our energy requirements and cause a minimum of environmental impact. Here are the choices we see that are available to us:

Energy conservation programs can help ensure more efficient use of electrical energy. At B.C. Hydro we are actively promoting the use of energy conservation through such programs as Power Smart and Resource Smart.

The Power Smart program encourages B.C. Hydro's customers to reduce future growth in the demand for electrical energy by advocating more efficient use of electricity. We are investing $225 million over the next 10 years in Power Smart initiatives for homeowners, commercial users, and industry.

Resource Smart is aimed at making B.C. Hydro's existing generation and transmission systems more efficient and adding power generating facilities to existing hydro dams. Through this program, we hope to create an additional 4000 million kilowatt hours (kW.h) of power per year by improvements to existing facilities. That's about 10 per cent of our current domestic load, or an amount of power equal to the yearly power requirements of the City of Vancouver.

However, if the province is to continue to grow, it is unlikely that we will be able to meet all of our future electricity needs through conservation efforts alone. We will need to generate and then transmit additional power. (Our Twenty Year Resource Plan describes these and other options in greater detail. I encourage you to call our Information Line to obtain a copy. Look for the number on the back page of this newsletter).

We realize, however, that any decisions we make about our energy needs will affect not only the people of our province, but its wildlife and natural habitat. Quite simply, decisions about issues of such magnitude must be made not only by us at B.C. Hydro, but by all the people of the province.

When projects are proposed for local areas - such as our plans for the Kelly Lake to Cheekye transmission line, we want to know what you think. We are trying to make the best decisions we can based on as much community input as possible.

Developing a plan to ensure an adequate supply of electricity for British Columbia over the next 20 years requires that we strike a balance between energy needs and environmental and social concerns.

We must make the best decisions we can, weighing all of these considerations and hope these decisions will be the right ones for a very uncertain future. It is a responsibility that we at B.C. Hydro do not take lightly and neither, we believe, do you.

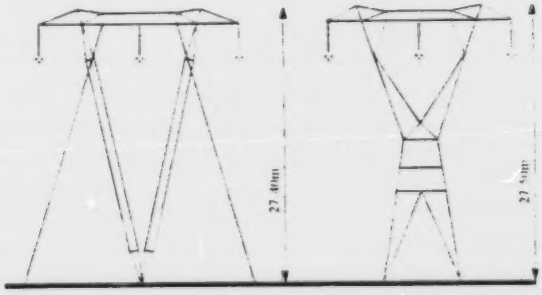
History of the project

1970	First 500 kV Kelly Lake-Cheekye transmission line constructed.
1980	Double circuit 500 kV line between Kelly Lake and Cheekye proposed with Creekside substation near Pemberton.
1980-84	Public expressed concern about such issues as electro-magnetic field effects, visual impacts and Creekside sub-station.
1983	Load forecasts for the Lower Mainland and Vancouver Island reduced due to lower than expected growth. Double circuit line dropped in favour of single circuit line. Need for Creekside substation eliminated.
1984	Recession in B.C. sharply lowered forecast demand for electricity. Project deferred.
1983-87	Improvements made on the Interior to Lower Mainland transmission system, to delay the need for new transmission lines.
1988	Load forecast indicates that demand for electricity in southern B.C. will exceed the capacity of the transmission system by about 1995. Project planning resumes for 500 kV single circuit line.

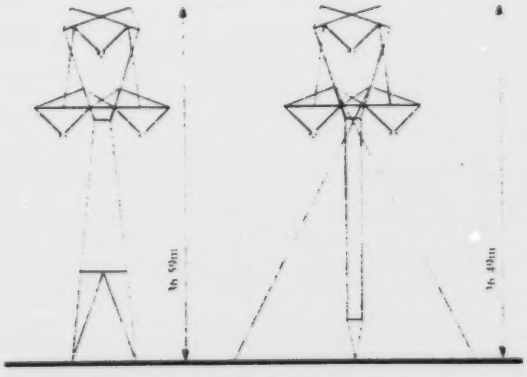
Current and future

1989	Environmental studies and active public consultation program begin on new proposal.
1990	Studies expected to be complete; application would be submitted to the B.C. government.
1992	Construction phase could begin as early as 1992, if government approval is received and the demand for electricity meets or exceeds forecasts.

KELLY LAKE - CHEEKYE
500 kV TRANSMISSION LINE PROJECT
STRUCTURE TYPES



OUTLINE OF EXISTING 500 kV STRUCTURE TYPES

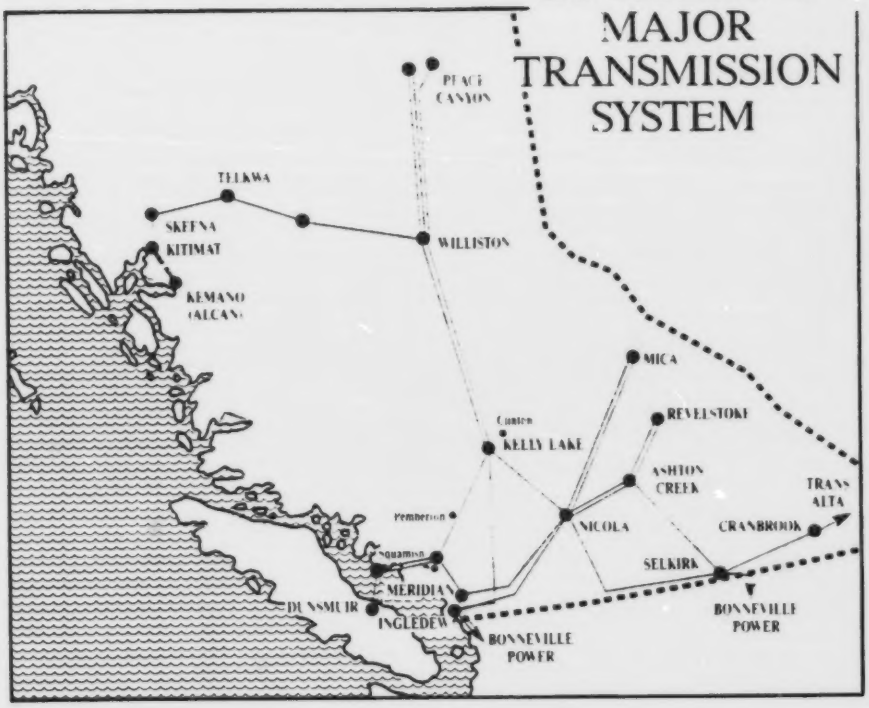


OUTLINE OF ALTERNATIVE 500 kV STRUCTURE TYPES

What alternative corridor options are there?

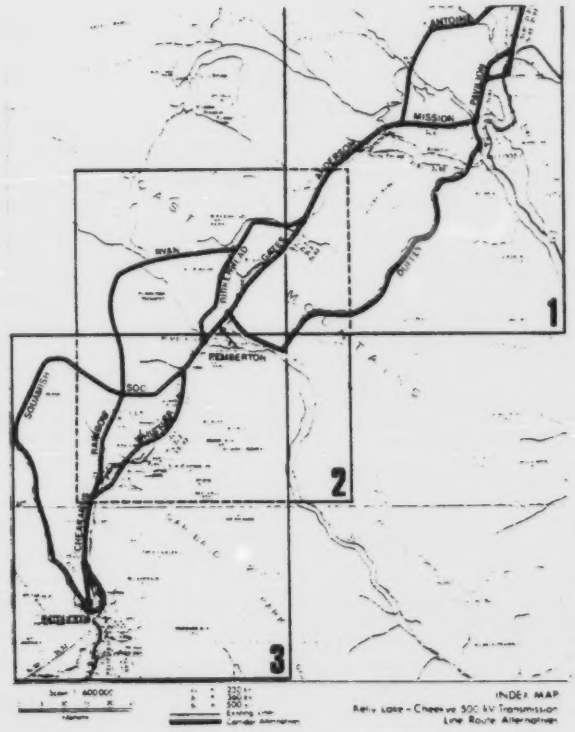
While there are a number of ways of generating electricity, transmission lines are the only practical way of moving electricity from the generating source to the customer. In order to maintain reliability and avoid blackouts transmission lines are connected to form a system. This way, if one line is out of service, electricity will flow on the remaining lines, allowing the system to continue to function. The following drawing illustrates B.C.'s integrated transmission system.

In addition to the Kelly Lake-Cheekye line, two other possible transmission line corridors to the Lower Mainland were identified and assessed - one between Kelly Lake and Ingledow and the other between Nicola and Meridian. The Nicola to Meridian line is being studied now but the Kelly Lake - Cheekye line is the most feasible alternative for development in the nearer term.



Project Description

As indicated earlier, studies show that the proposed new Kelly Lake to Cheekye line could be needed by about the mid-1990s. Self- supporting and guyed steel structures may be used depending on terrain and other factors; however, the choice of tower types has not yet been determined. The towers for the new 500 kV line may look similar to the existing 500 kV structures. An alternative structure type is also being considered. This alternative may allow for a reduction in the cleared area, and it may have electrical benefits as well. It is possible that both types of structures could be used for different sections of the route, depending on local factors.



Route selection

A route for the new line has not yet been selected. While topography, land use and other constraints limit where the line could go, some flexibility remains in determining the route. For example, in the area between Shalalth and Cheekye, one existing 230 kV line could be removed and its right-of-way utilized wherever practical for the new line.

In some areas a new alignment may be desirable due to concerns such as aesthetics or land use. B.C. Hydro would like your input to help identify the best route options.

The map below shows some route options identified during earlier studies. These and other options will be discussed during the consultation process.

Government Review Process

A final decision about the Kelly Lake - Cheekye project will be made by the Provincial Government. All large energy projects in B.C., including transmission lines over 500 kV., must satisfy the requirements of the B.C. Utilities Commission Act. This Act regulates utilities and provides for the review and certification of projects that generate, use, store, transport or transmit large quantities of energy. All regulated projects must obtain an Energy Project Certificate before construction and an Energy Operation Certificate before operation.

Once B.C. Hydro has made an application to the Ministry of Energy, Mines and Petroleum Resources, the Minister will select one of several alternative review procedures. Public hearings may be held, depending on the procedure chosen.

For more information

If you would like more information about this or other B.C. Hydro projects please visit your local library, or call our toll-free project information line at 1-800-663-1377. You could also drop in to your local Hydro office or write:

External Relations
18th Floor, B.C. Hydro
970 Burrard Street,
Vancouver, B.C.
V6Z 1Y3

I would like to be included on the Kelly Lake - Cheekye Transmission Line mailing list.

Name _____

Address _____

City _____

Postal Code _____

Affiliation (if any) _____

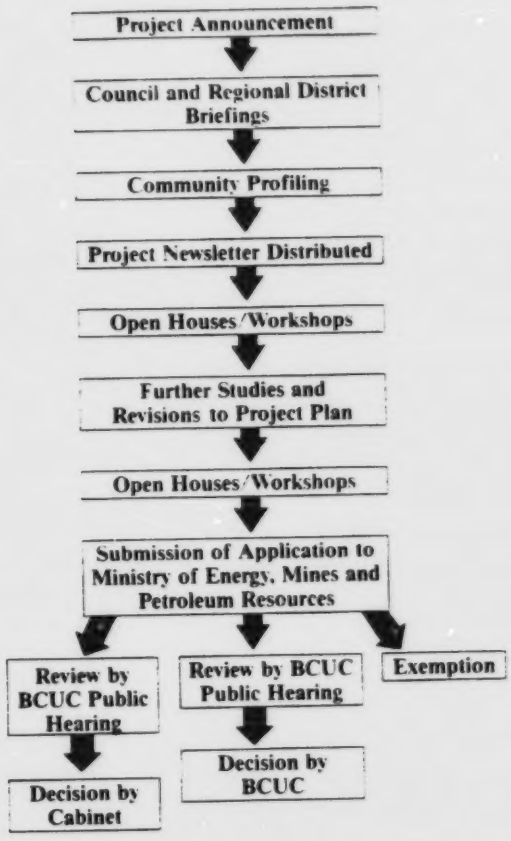
Telephone Number _____

I would like more information on:

- ☐ 20 year Resource Plan
- ☐ Property Purchase/Lease
- ☐ Vegetation Management
- ☐ Electric & Magnetic Fields
- ☐ Power Smart/Resource Smart
- ☐ Government Review Process
- ☐ Public Consultation Schedule
- ☐ Other (please specify) _____

Please mail to the Kelly Lake-Cheekye Project at
External Relations, 18th Floor, B.C. Hydro
970 Burrard Street, Vancouver, B.C. V6Z 1Y3

Public Consultation Schedule



Public Consultation

Over the next few months, you are invited to participate in community meetings, planning workshops and other forums. At these meetings information will be available about the project. You can talk with members of the project team. B.C. Hydro wants to hear your views and obtain your input on important project decisions.

The first round of community meetings will begin in the fall. After a full public discussion of key issues, including possible routes, environmental and technical studies will be completed and further studies will be undertaken as required and the project plans revised to reflect public input. A second round of community meetings will be held in late 1989 to receive comments on the final proposal. B.C. Hydro plans to submit an application to the government after the completion of the two phases of public consultation.

If approved by the government, construction of the new line will begin only if the load forecasts are realized. The earliest possible "in-service" date, given a five-and-a-half year construction period, will be late 1995. The public consultation program will continue throughout the design and construction phases of the project.

BC hydro

Kelly Lake-Cheekye 500 kV Transmission Line

PROJECT NEWSLETTER

No. 2 May 1990

Public input suggests option is emerging

As part of a study for a second 500 kilovolt (kV) transmission line between Kelly Lake substation near Clinton and Cheekye substation near Squamish, B.C. Hydro conducted a series of open houses and met with government staff, elected representatives, interest groups and individuals in the study area.

In October we held eight open houses in the region. You may have attended one of these gatherings. The aim of these open houses and small group meetings was to exchange information and to stimulate public discussion on the project and the possible route options.

In light of your suggestions and as a result of information gathered for environmental and technical studies, an acceptable option does appear to be emerging. On the whole people wish us to follow the existing lines as much as possible and not to open up new rights-of-way. While there is generally agreement on the use of the existing transmission corridor, in some areas further discussions are still needed. For example the option through the Resort Municipality of Whistler.

Through listening to your questions and concerns, we have gained valuable insights into how you feel about the transmission line. Many of you made suggestions on how we could improve the project and in some instances these have already been incorporated into the project planning process.

A visitor to one of the open houses studies an aerial map of the route options with a Hydro project team member.

We will be returning to your area to host further discussions with interested agencies, groups and individuals. If you would like further information on the project please call or write to the address on the back of this newsletter. ■

Taking a closer look at the study

In planning for this project, B.C. Hydro identified feasible route options between Kelly Lake substation and Cheekye substation. These options are shown on the map on the following page.

The planned 500 kilovolt (kV) transmission line would run from Kelly Lake substation near Clinton to Cheekye substation near Squamish. The options identified have been reviewed by technical and environmental specialists taking into consideration such factors as terrain, climatic exposure, route length, cost and maintenance considerations, as well as social, economic and environmental impacts.

Running south from Kelly Lake substation, there are presently two existing 500 kV transmission lines as well as two 230 kV woodpole lines. One of the 500 kV lines follows the Fraser Valley to the Ingledow substation in the Lower Mainland. The other runs from Pavilion and crosses the Fraser and Bridge rivers and then traverses the Mission ridge to the Shalalth area. The two 230 kV lines run from Kelly Lake substation to the Bridge River generating station at Shalalth via the Fraser River, Lillooet and Seton Lake.

South of the Bridge River generating station at Shalalth, the one 500 kV line and two 230 kV lines continue south to Cheekye via Anderson Lake, D'Arcy, Pemberton and Whistler. In addition a lattice-steel 360 kV line joins these lines to Pemberton before turning south and following Lillooet Lake and Lillooet River to the Harrison area.

The route we perceive to be generally favoured follows the one 500 kV line from Kelly Lake substation through the Shalalth area and from there would generally replace one 230 kV line to Cheekye. In some areas deviations from the 230 kV alignment are recommended for environmental and other reasons.

continued on page 4

Looking at the opti

Although no route option has been finalized, the existing transmission line corridor (with some alteratio
A summary of your comments an

Existing Pavilion/Mission segments versus Antoine

The Antoine segment crosses very difficult terrain on the east side of the Fraser Canyon. The construction of access roads in this area would be difficult and visually disturbing. By contrast roads have already been constructed in the difficult areas of the existing corridor.

The effect on wildlife as a result of using the existing route would be very small However use of the Antoine route would disturb the bighorn sheep winter range in the Fraser Canyon and have serious visual impacts in the Antoine Creek Valley, Fraser Canyon and at the Camelsfoot Bend on the Bridge River. Wilderness potential of the Antoine Creek Valley would be disturbed by the new transmission line.

At the Lillooet open house representatives of a community situated in Yalakom Valley/Antoine Creek Valley expressed their opposition to the possibility of the transmission line using the Antoine route. Subsequent to this open house, a meeting was held with area residents in which they reiterated their concerns regarding the impact that this route would have on their community.

The Antoine option also crosses the sites of two old Indian villages, with important heritage value. A new crossing of the Fraser River on the Antoine route presents a hazard to light aircraft.

Existing Gates/Pemberton/Green/Whistler segments versus Birkenhead/Ryan/Rainbow segments

At the Birken open house, local residents said they were concerned about the Birkenhead/Ryan/Rainbow option which would result in an addition of 22 kilometres of transmission line. In addition concern was expressed about the negative impacts that transmission line rights-of-way have on property values. This option also crosses Birkenhead Lake park and the proposed Mount Ronayne recreational area on the Owl-Tenquille ridge. Ryan Creek valley is valued for grizzly bears and mountain goats. Both of these species are sensitive to disturbance. At the Birken open house, local residents also expressed concern about visual impacts of transmission lines on these areas.

Lower Cheakamus sub-options

Earlier studies proposed the use of the existing corridor. During the Squamish open house and in subsequent correspondence a number of Lower Cheakamus residents opposed the use of the existing right-of-way through the valley. It also became apparent that the North Vancouver Outdoor School would be severely impacted by the use of the existing right-of-way. As a result sub-options for this section were identified and have been developed. A generally acceptable route which bypasses the Outdoor School has emerged (the south sub-option described below). However further analysis and discussion is required before a conclusion on a route can be reached among the alternative routes north of the Outdoor School. This is the area where residents voiced concerns over use of the existing right-of-way. Alternative routes include a west sub-option and an east sub-option in addition to the existing route.

West sub-option versus the existing route

The western option is on a steep side hill and would be highly visible for most of the route from Highway 99 and the valley floor. It may also cause siltation of the Cheakamus River The existing route is not visible from the highway and is screened by trees.

East sub-option versus the existing route

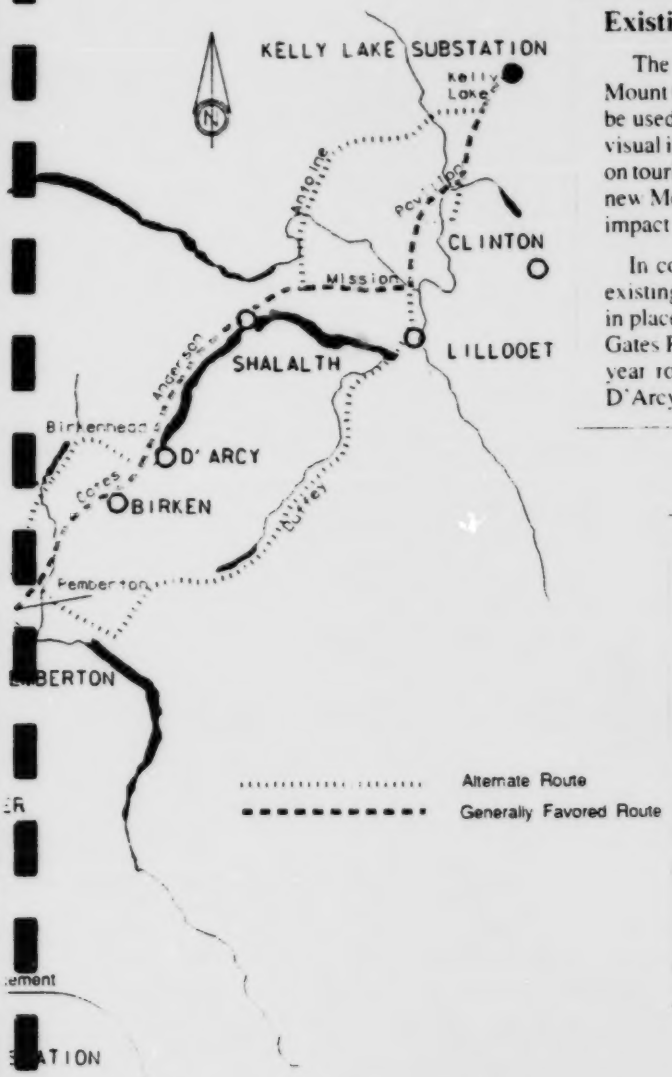
The existing route has much lower visual impact than the east sub-option and avoids the Brohm Lake recreation site.

South sub-option versus the existing route

The existing route crosses the Outdoor School and the Cheakamus Indian Reserve This south sub-option avoids these areas and appears more favourable. However this sub-option would be near a mythological site of the Squamish Indian Band This requires further study to ensure there is no impact on this site.

s - a possible route

option most people appear to support, subject to further discussions with the Native Bands and others.
- on the various options follows.



Existing Mission/Anderson /Gates segments versus Duffey

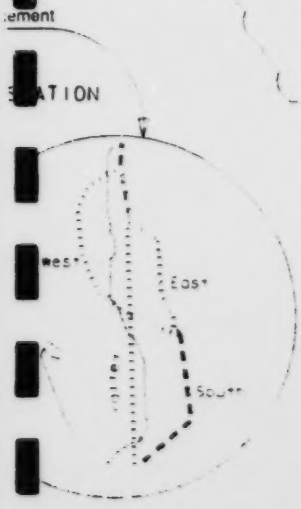
The Squamish Lillooet Regional District, the village of Lillooet and the Mount Currie Indian Band expressed their preference that the existing corridor be used and that the Duffey Lake route be avoided. The major concern is the visual impact along the scenic Duffey Lake road and the effect this would have on tourism. But there is also concern about visual impacts in Lillooet and at the new Mount Currie village. Use of this route would also have a higher adverse impact on wildlife, forestry and recreation.

In contrast the impact through use of the present corridor is lower as an existing right-of-way can be used south of Shalalth. Road access is generally in place and improvements can be made in line location at D'Arcy and in the Gates River Valley. Local residents were concerned about the upgrading and year round maintenance of the Hiline Road which links Seton/Shalalth to D'Arcy.

Existing Gates/Pemberton segments versus Birkenhead/ Owl segments

The Birkenhead/Owl option is six kilometres longer than the existing section. Its use would have severe visual impacts in Birkenhead Provincial park and in the Mount Ronayne recreation area planned for the alpine region of the Owl-Tenquille ridge.

The Birkenhead/Owl option would also require a crossing of the watershed for the village of Pemberton and a new right-of-way across the settled area west of Pemberton. Concerns of residents in the Pemberton area included the effect of a new right-of-way on land use and property value. Visual impacts of descent into Pemberton Valley and on the hill sides west of Pemberton would be high. Local residents of Pemberton also expressed concern about the impacts of the existing Gates/Pemberton segments on existing and proposed land uses in the area.



Soo/Rainbow segments versus Whistler segment

A generally agreed on route through the resort municipality of Whistler has not yet emerged. The Soo/Rainbow route requires use of 41 kilometres of productive forest land and goes through areas of possible future recreational importance to Whistler. Its use would remove one transmission line through Whistler, though it would usually be the centre of three lines.

The existing corridor option would use the right-of-way which currently runs from Green Lake to Alta Lake and thereafter diverge to a new route. This would result in removal of one line along the highway south to Brandywine Park.

Public discuss concerns at open houses

Close to 300 people attended our eight open houses held in Clinton, Lillooet, Shalalth, Pemberton, Birken, Whistler and Squamish. Initially only seven open houses were planned but on request an eighth was organized for the Seton Lake Indian Band.

Not only did we learn about specific project concerns during these open houses, but this also gave us an opportunity to get to know your more general concerns about electrical power. During the public consultation program a variety of topics were raised. These ranged from questions about project justification and electrical energy export, to concern with visual impact and electric and magnetic fields (EMFs). Many of you were interested in the control of vegetation within the right-of-way, how we compensate property owners and what benefits to local communities would result from the construction of the new transmission line.

Where possible we have tried to answer your questions and encourage you to continue to raise your concerns, either at meetings or by completing the clip-out in this newsletter ■

What you had to say

Below are some of the comments you had to make about the project and how you would like to see it developing. We have not included any names in the interests of privacy.

"It's good to see BCH coming out with the info . .. there is now an avenue for voicing our concern. What sort of an impact we'll have I'm not sure as we're just a small part of a big project."

"B.C. Hydro should encourage use of the right-of-way for horticulture How about christmas tree farms for small communities?"

"I am opposed to future expansion to meet energy demands. It is time to restrict the wanton use of electricity."

" I feel that Hydro should stay on the existing lines where feasible and should also not use valley bottoms as this is where most people live." ■

Would you like to know more about this project?

If you would like details or have comments on the Kelly-Cheekye 500 kV transmission line study please call us at 1-800-663-1377 or write to:

External Relations
19th Floor
970 Burrard Street
Vancouver,B.C V6Z 1Y3

Name: _____

Address: _____

Telephone number: _____

Comments: _____

_____

_____

_____

- closer look *from page 1*

These route options reflect the comments and suggestions which were provided at our Open Houses. Fundamental to our development of this project is your input Some of your comments are hi-lighted on this page and pages two and three of this newsletter.

Most of you who expressed a preference were in favour of the existing corridor. However no final routing can be determined without further discussions with Native Bands in the specific study areas.

The public consultation program has not yet identified an agreed on a route in the Whistler area. B.C. Hydro will continue to pursue discussions with the community to determine which route option this community favours. Further analysis and discussions are also required to identify an agreed route in the Lower Cheakamus area north of the Outdoor School. ■

The steps ahead

We will be returning to your area to discuss the findings from the environmental and technical studies, and the first phase of the public consultation program. This will provide the opportunity to review the route we perceive to be generally favored, and the modifications made in light of your suggestions.

We have just completed a Preliminary Planning Report which consolidates the results of the public consultation program and all the studies. This report will be available from B.C. Hydro information centres. You can also get a copy by calling our toll free number or writing to External Relations, at the address below. Copies of the report are also being circulated to a number of government agencies.

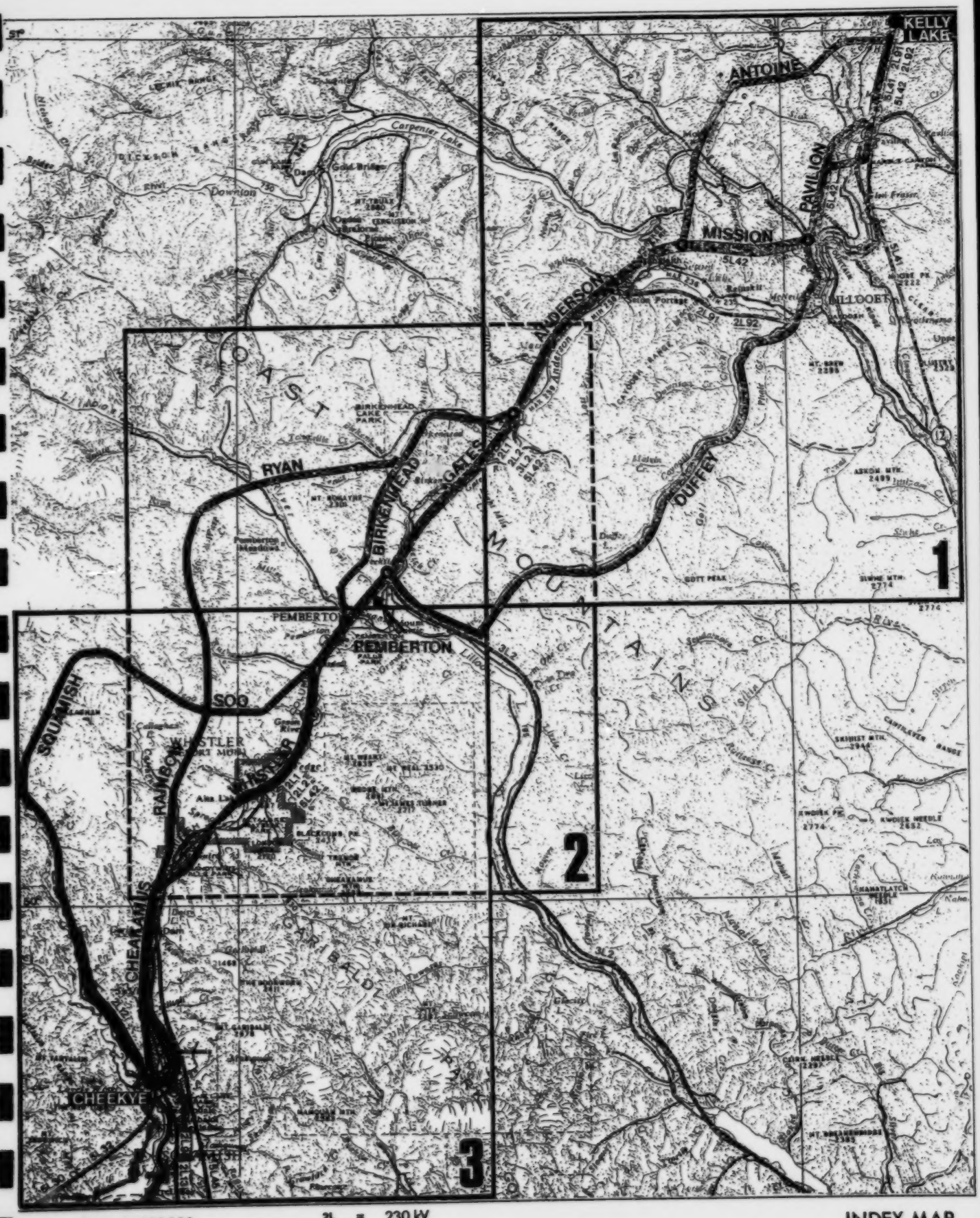
Your responses on this project will be reflected in the environmental and public consultation reports and in the Energy Project Certificate (EPC) application.

If you have any queries about these studies please call our toll free number at 1-800-663-1377 or write to:

External Relations
19th Floor
970 Burrard Street
Vancouver, BC
V6Z 1Y3.

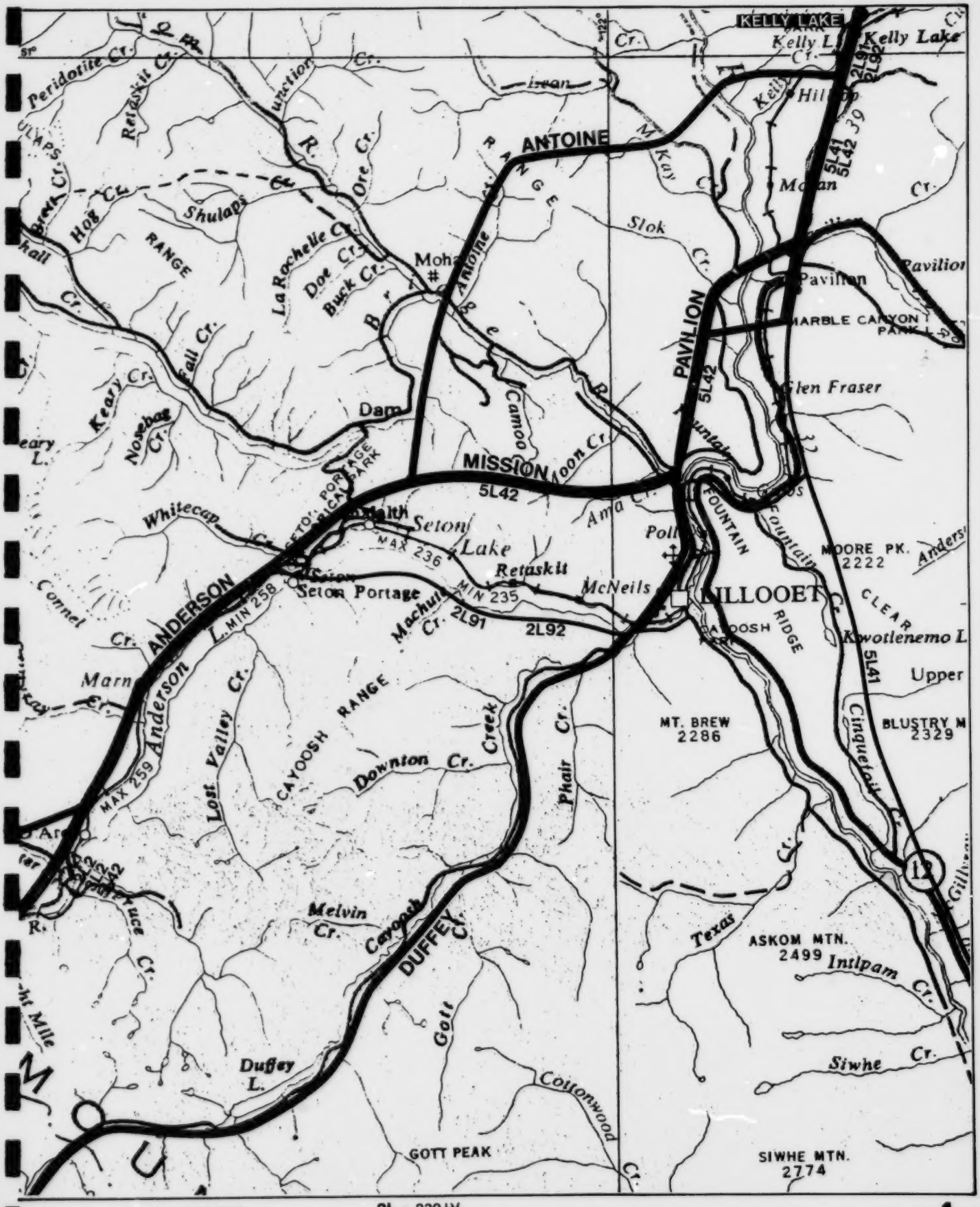
BC hydro

KELLY LAKE-CHEEKYE
500 kV TRANSMISSION LINE
POSSIBLE ROUTES
Figure 2
July 1989



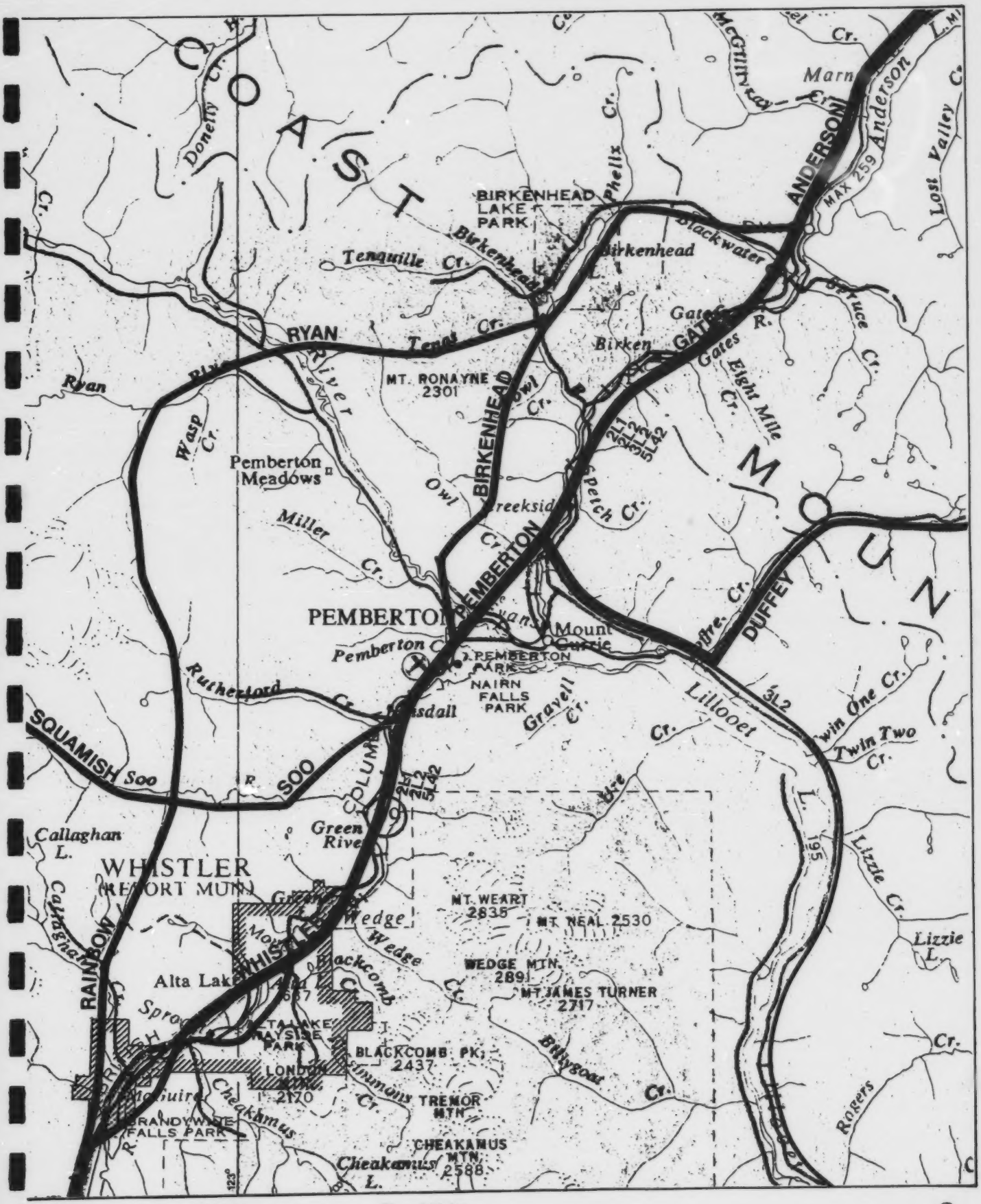
INDEX MAP

Kelly Lake – Cheekye 500 kV Transmission Line Route Alternatives



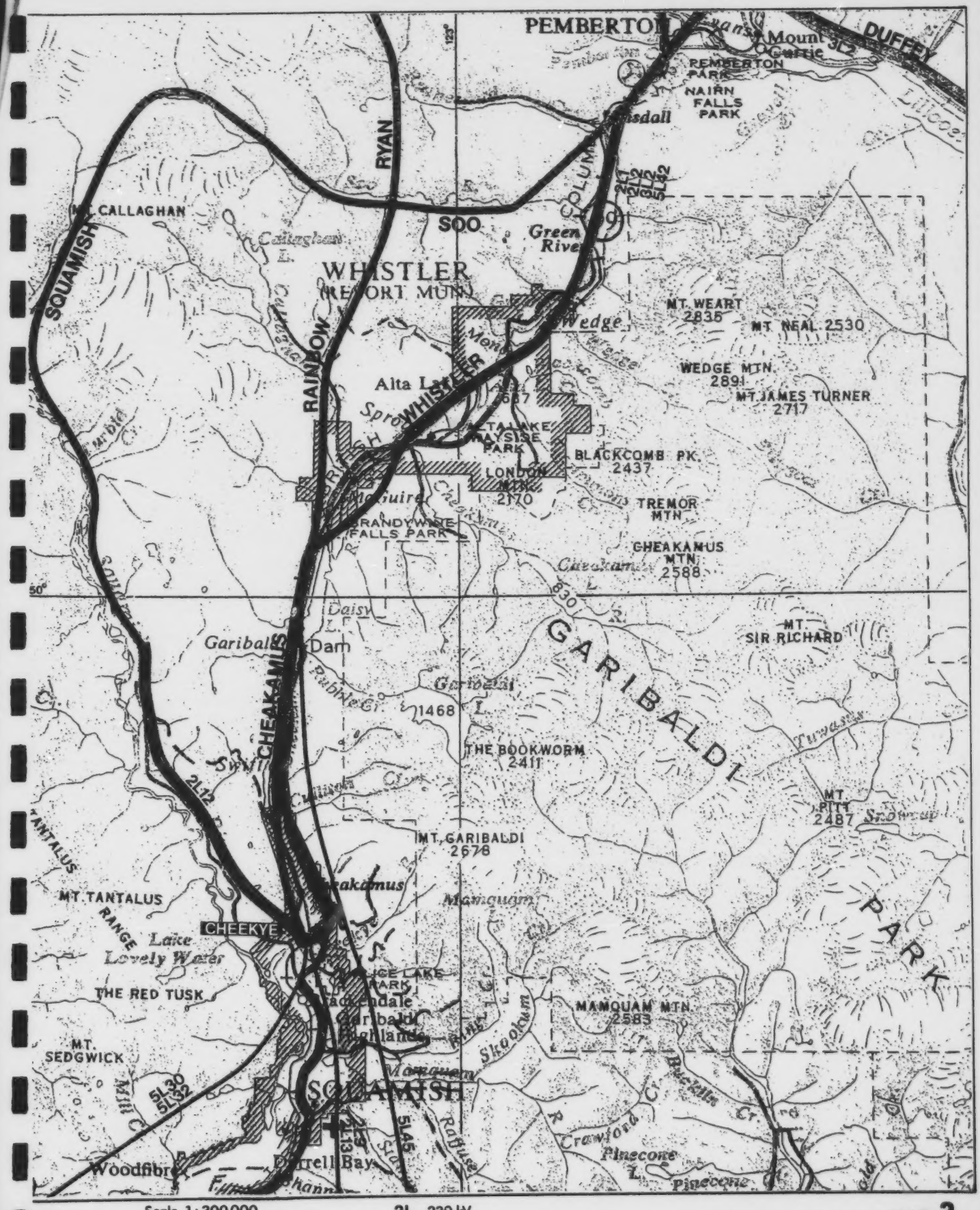
MAP 1

Kelly Lake – Cheekye 500 kV Transmission Line Route Alternatives



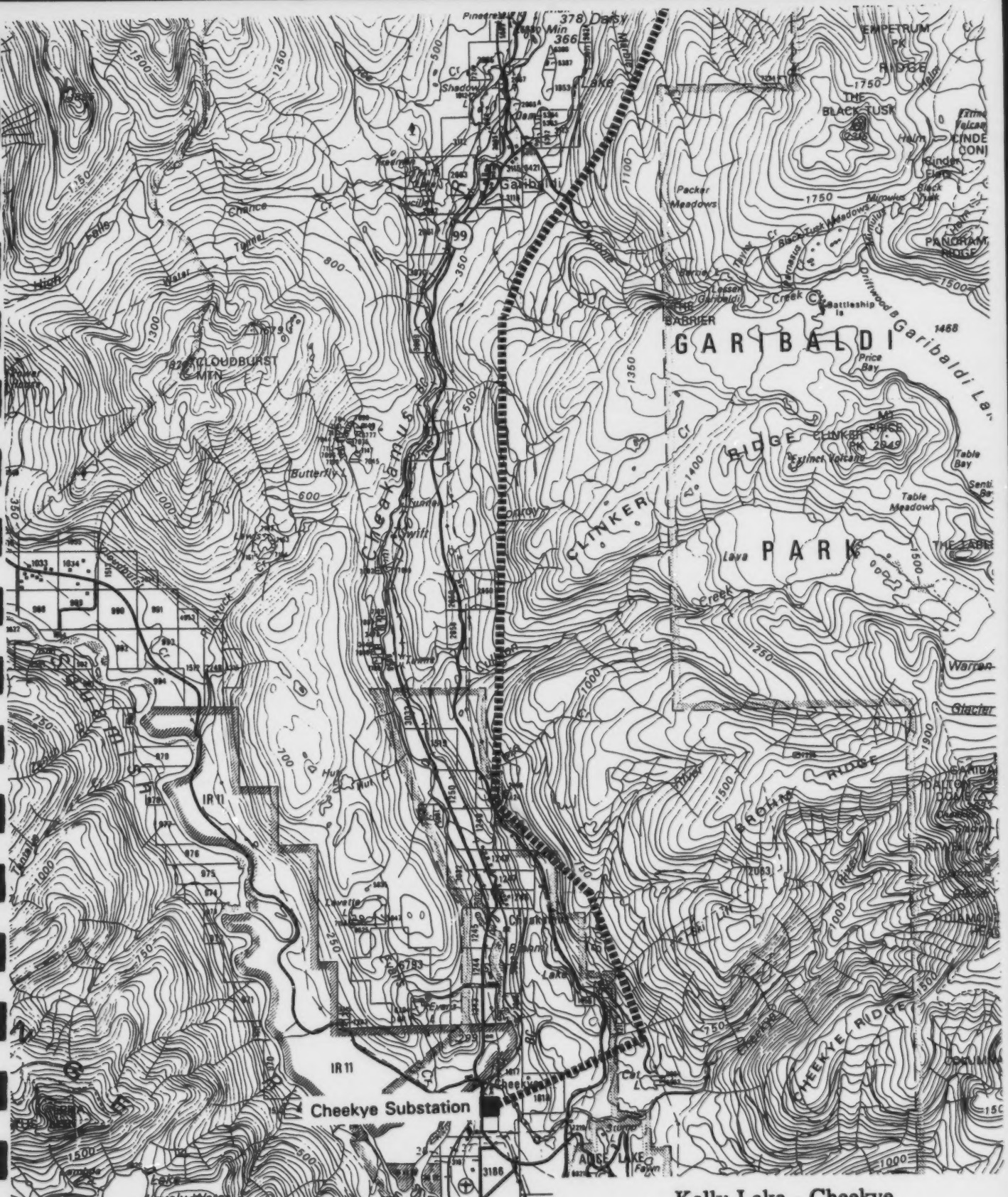
MAP 2

Kelly Lake – Cheekye 500 kV Transmission
Line Route Alternatives



MAP 3

Kelly Lake – Cheekye 500 kV Transmission Line Route Alternatives



Kelly Lake - Cheekye
500 kV Transmission Line

Proposed *High Cheakamus* Route ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

November 1990

Scale 1:100,000

BC hydro

A Prospectus for the KELLY LAKE SUBSTATION TO CHEEKYE SUBSTATION SECOND 500kV TRANSMISSION LINE

September 1989

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Prospectus
Kelly Lake Substation to Cheekye Substation

A Second 500 kV Transmission Line

September 1989

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3 — Basic Structure Types
4 — Proposed Project Schedule — Phase 1 Planning and Development
5 — Proposed Project Schedule — Phase 2 Design and Construction

Introduction

Recent forecasts of electrical demand in the Lower Mainland and on Vancouver Island, combined with engineering studies of the electrical transmission system, have identified a potential requirement for new transmission in the mid-1990s to ensure the continued reliable supply of electricity to customers in those regions. This Prospectus outlines B.C. Hydro's studies for a second 500 kV[1] transmission line between Kelly Lake Substation near Clinton and Cheekye Substation near Squamish to meet that potential requirement and includes:

- a brief description of the project and a schedule for meeting an in-service date as early as the fall of 1995;
- a summary of the rationale for carrying out studies for a second Kelly Lake to Cheekye 500 kV line; and,
- an outline of the studies planned to determine a route for the line, including a comprehensive public consultation program.

For further information please write:

Manager, External Relations
B.C. Hydro
970 Burrard Street, 18th Floor
Vancouver, B.C. V6Z 1Y3

Or call the toll free project information number: 1-800-663-1377

If in the Lower Mainland, call: 663-3616.

Project Description and Schedule

The project under study consists of a single circuit, 500 kV steel tower transmission line between Kelly Lake and Cheekye substations (Fig. 1) along a route yet to be determined. Presently there are two 230 kV transmission lines and one 500 kV transmission line between those substations. Both the 230 kV lines also connect into Bridge River Terminal. The two 230 kV lines and the 500 kV line follow completely different routes between Kelly Lake and Bridge River but from Bridge River to Cheekye the three lines are routed generally along a common corridor. Some of the possible routes being considered for the second 500 kV line are shown in Figure 2. The route alternative utilizing the existing transmission line corridor from Bridge River to Cheekye Substation would entail the removal of one of the existing 230 kV circuits and replacement of that circuit with the proposed 500 kV line where practicable.

While both self-supporting and guyed structures would be used in the construction of the second 500 kV line, the choice of tower type has not yet been determined. Schematic drawings of the types of structures being considered are shown in Figure 3. The structures shown in Figure 3A are similar to those of the existing 500 kV line between Kelly Lake and Cheekye. Those shown in Figure 3B would allow a reduced right-of-way width requirement and correspondingly less clearing as well as some potential electrical benefits. It is possible that both types of structures could be used with the choice along each section of the line depending on local factors.

A series capacitor bank[2] would be installed near the mid-point of the new line, possibly at the existing Creekside Capacitor Station north of Pemberton depending on the selected route.

A project schedule which would meet an in-service date as early as the fall of 1995 is outlined in Figures 4 and 5. Figure 4 covers activities during Phase 1, the planning and development phase, and Figure 5 covers activities during Phase 2, the design and construction phase. Although public

[1] Kilovolt (kV) or thousand volts, the operating voltage of the transmission lines.
[2] Series capacitors are inserted in transmission lines to increase the amount of electricity that can be transmitted.

consultation is an on-going activity that will continue throughout both phases, particular emphasis will be placed on public involvement during Phase 1, as identified in the schedule.

Following the Phase 1 public consultation program and completion of the environmental and engineering studies of route alternatives, an Application for an Energy Project Certificate would be submitted to the Minister of Energy Mines and Petroleum Resources under the terms of the Utilities Commission Act.

Project Study Rationale

As noted in B.C. Hydro's "Twenty-Year Resource Plan" dated April 1989, approximately 70% of the electricity B.C. Hydro produces is consumed in the Lower Mainland and on Vancouver Island. Most of this electricity flows through the Interior to Lower Mainland transmission system from generation sources located in the north on the Peace River and in the southeast on the Columbia River system (Fig. 1). Demand for electricity continues to grow in the Lower Mainland and on Vancouver Island and these two regions account for almost 75% of the expected growth in electrical requirements in the province over the next ten years.

All planned generating facilities are located at sites remote from the Lower Mainland and Vancouver Island regions. If present growth trends continue, new transmission will be required to reliably transmit electricity from new generating plants to the Lower Mainland and Vancouver Island load centres. A new 500 kV transmission line between Kelly Lake Substation near Clinton and Cheekye Substation near Squamish has been identified as the best alternative to reinforce the Interior to Lower Mainland transmission system. With growth in demand and lack of reinforcement, loss of a major line during heavy load periods would result in a widespread loss of load in the Lower Mainland and on Vancouver Island.

Depending on timing and routing, the estimated total cost of the Kelly Lake to Cheekye 500 kV transmission project, including inflation, corporate overhead and interest during construction, would be in the $170-250 million range. The new line would maintain system reliability and greatly reduce system losses.[3] With reduced losses, more of the electricity that is generated would be available for users resulting in net savings in the amount of electricity that must be generated to service customer demand. The total value of the savings in losses that would be realized by a second 500 kV transmission line between Kelly Lake and Cheekye could account for approximately 70% of the capital and operating costs associated with the new line.

Route Selection Process

In the late 1970s and early 1980s, B.C. Hydro investigated routes for additional 500 kV transmission between Kelly Lake and Cheekye substations. The new studies will use relevant information from the previous studies but will not be limited to those findings. The present route selection process will be concerned with optimizing land use and with minimizing the social, economic and environmental impacts of the new line. The rough terrain, potential for severe weather conditions, route length and the possibility of using portions of existing 230 kV right-of-way will also be considered in selecting a route. Some of the possible routes to be studied are shown in Figure 2 but no commitments have yet been made.

Public Consultation Program

In the late 1970s and early 1980s, B.C. Hydro held numerous public meetings to discuss this project. The present public consultation program will identify and respond to community concerns in a proactive and open manner. Meetings and open houses will be held in communities along the possible routes to allow individuals, groups and all levels of government to exchange information and concerns with B.C. Hydro staff.

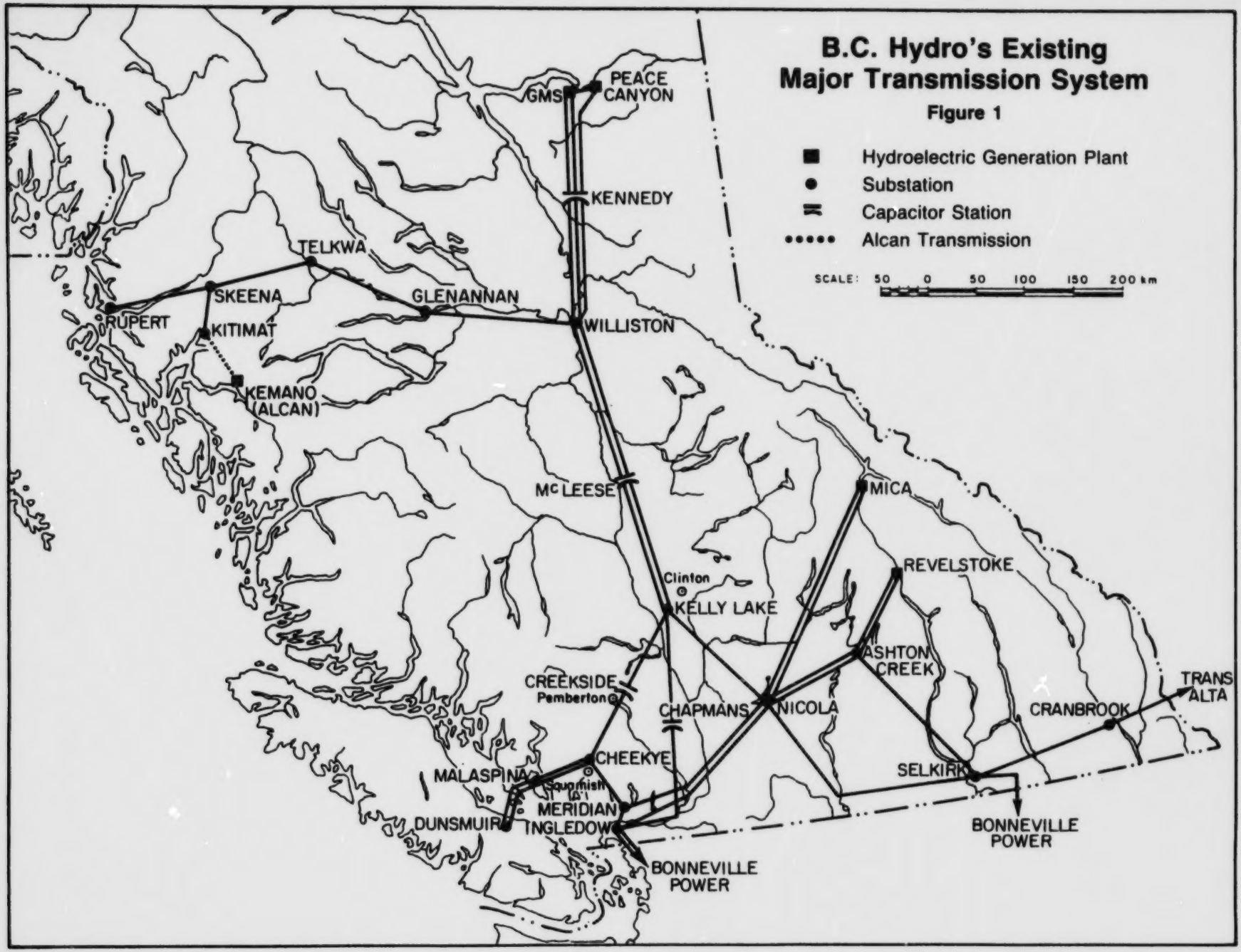
---

[3] Losses are incurred in electric systems because the flow of electric current heats the wires through which it flows.

The consultation program has begun. Regional Districts and municipal councils are being briefed and a press release has been issued. This is an on-going program and B.C. Hydro will ensure that engineering and environmental study results and project information are available to interested groups and individuals.

Environmental and Engineering Studies

Environmental studies of possible routes will include assessments of potential ecological and social impacts of the proposed second 500 kV line and ways of avoiding or mitigating those impacts. The environmental study team will use information from all available sources including government resource agencies, special interest groups and individuals. The environmental studies will be coordinated closely with engineering studies which will be concerned with design, security, cost and technical feasibility of route alternatives.


B.C. Hydro's Existing
Major Transmission System
Figure 1
Hydroelectric Generation Plant
Substation
Capacitor Station
Alcan Transmission
SCALE: 50 0 50 100 150 200 km
PEACE CANYON
GMS
KENNEDY
TELKWA
SKEENA
GLENANNAN
RUPERT
KITIMAT
WILLISTON
KEMANO (ALCAN)
McLEESE
MICA
REVELSTOKE
Clinton
KELLY LAKE
ASHTON CREEK
CREEKSIDE
Pemberton
CHAPMANS
NICOLA
CRANBROOK
TRANS ALTA
CHEEKYE
MALASPINA
Squamish
SELKIRK
MERIDIAN
DUNSMUIR
INGLEDOW
BONNEVILLE POWER
BONNEVILLE POWER

BC hydro

KELLY LAKE-CHEEKYE
500 kV TRANSMISSION LINE

POSSIBLE ROUTES

Figure 2

July 1989

Kelly Lake — Cheekye
500 kV Transmission Project
Structure Types

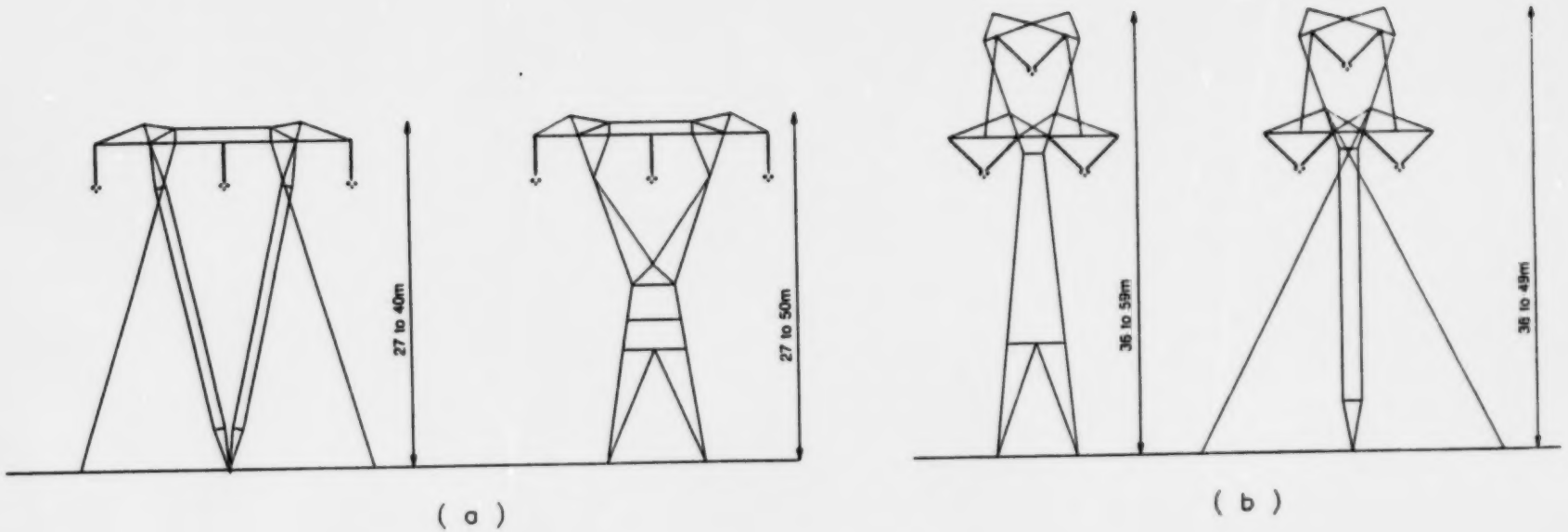
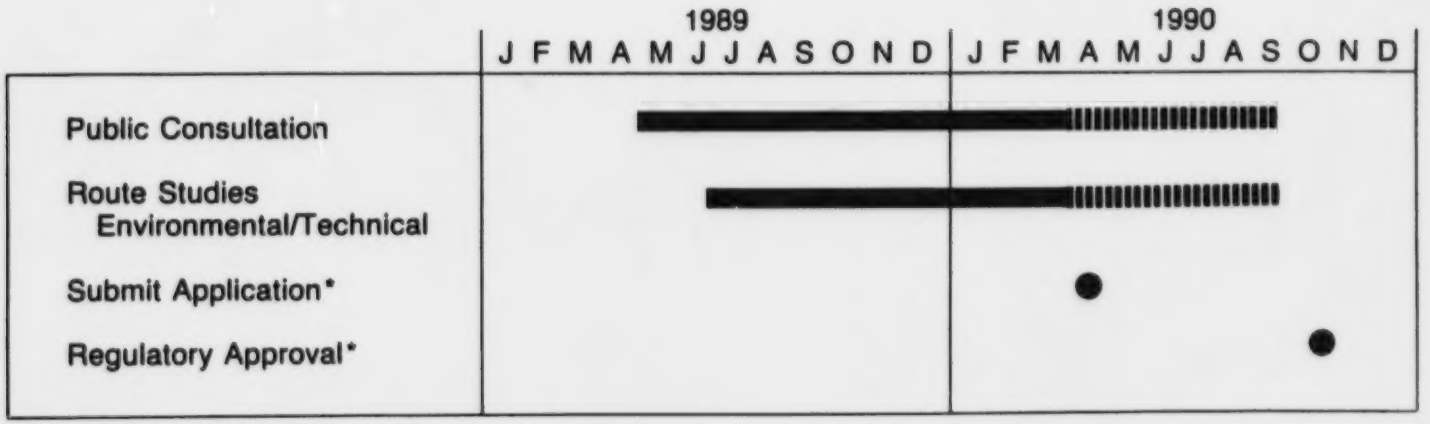


Figure 3

Kelly Lake — Cheekye
500 kV Transmission Project
Proposed Project Schedule

Phase 1
Planning and Development

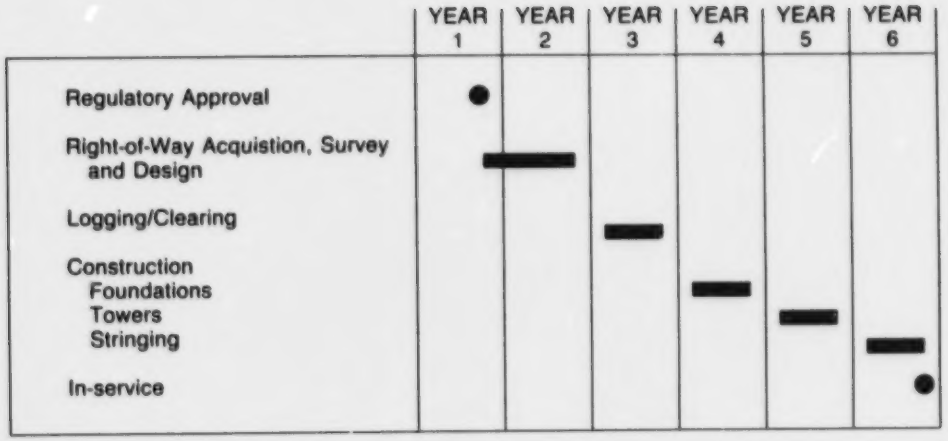


* earliest possible date

Figure 4

Kelly Lake — Cheekye
500 kV Transmission Project
Proposed Project Schedule

Phase 2
Design and Construction



Notes:

- Begins with regulatory approval
- Entails right-of-way acquistiion, survey, design, clearing and construction
- Requires approx. 5 to 5.5 years
- Based on Phase 1 schedule, the earliest in-service date would be late 1995.
- Actual in-service will be determined. It depends on a number of factors such as: actual load growth experienced, duration and results of public consultation program, etc.

Figure 5

BC hydro

Kelly Lake - Cheekye
A Planning Perspective

March 1990

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Canadian Cataloguing in Publication Data

Main entry under title:

The Second Kelly Lake to Cheekye 500 kV transmission line: a planning perspective

"Report no. SP 8903"

ISBN 0-7726-1028-2

1. Electric lines - British Columbia - Squamish-Lillooet. 2. Electric power transmission - British Columbia - Squamish-Lillooet. I. B.C. Hydro.

TK3144.S42 1990 621.319'13 C89-092257-8

B.C. HYDRO

THE SECOND KELLY LAKE TO CHEEKYE 500 KV TRANSMISSION LINE

A PLANNING PERSPECTIVE

SYSTEM PLANNING DIVISION
SYSTEM DEVELOPMENT

MARCH 1990

REPORT NO. SP 8903

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4 - Basic Structure Types
5 - Route Network
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7 - Proposed Project Schedule - Phase 2

Executive Summary[1]

The purpose of this report is to outline B.C. Hydro's planning process for major transmission projects and to explain how that process led to more detailed studies for reinforcing the Interior to Lower Mainland electric transmission system. A primary component of those studies and the focus of this report is a second 500 kV single circuit transmission line between Kelly Lake Substation near Clinton and Cheekye Substation near Squamish. A schedule is included for meeting an in-service date as early as the fall of 1995. This date along with all other dates and project proposals in this report are best estimates based on information available as of the date of printing.

Approximately 70% of the electricity produced by B.C. Hydro is consumed in the Lower Mainland and on Vancouver Island. The transmission system serving these two regions is now operating at its maximum capacity and some station equipment will be installed to reinforce the system prior to 1995. Furthermore, approximately 75% of the forecast increase in electricity consumption over the next ten years is expected to occur in the Lower Mainland and on Vancouver Island and all planned generation developments are located at sites remote from these two regions.

By the mid 1990s, if growth trends continue and the Interior to Lower Mainland transmission system is not reinforced, loss of a major system element during times of high electricity consumption would result in the sudden reduction of generation output and interruption of electricity to customers and in an increased risk of a widespread blackout. Therefore, it is imperative that plans be made to reinforce the major transmission system bringing electricity to these regions in order to maintain system reliability.

B.C. Hydro is now planning the following reinforcements to the Interior to Lower Mainland transmission system by approximately the dates shown. The need for these projects will be dependent on continuing growth in electricity consumption.

1990 Complete the American Creek Series Capacitor Station north of Hope at which series capacitors are being installed at the mid-point of the two 500 kV transmission lines from Nicola Substation, near Merritt, to the Lower Mainland.

1993 Install a static var compensator in the Lower Mainland or on Vancouver Island.

1995 Construct a second 500 kV single circuit transmission line between Kelly Lake Substation and Cheekye Substation including series capacitors, possibly at the existing Creekside Series Capacitor Station near Pemberton.

1998 Construct a second 500 kV single circuit transmission line between Nicola Substation and Meridian Substation north of Coquitlam including series capacitors at the American Creek Series Capacitor Station.

2001 Install another static var compensator in the Lower Mainland or on Vancouver Island.

[1] There is a Glossary of Terms at the end of this report and many words and phrases in the main body of the report are referenced to the Glossary. In this Executive Summary and in the Introduction no such specific references are made.

The existing 500 kV transmission line between Kelly Lake and Cheekye is one of the most heavily used in the system. The planned second line would share electricity flow with the existing line and thereby maintain the present level of system reliability while supplying an increasing demand for electricity. In addition, transmission system losses would be greatly reduced. The total value of the savings in transmission losses that would be realized by constructing a second line could account for approximately 70% of the total capital and operating costs associated with the line.

The above proposed sequence of system reinforcements can respond to higher than expected growth in electricity consumption by installing additional short lead time static var compensators. The Kelly Lake to Cheekye line can be deferred if growth is lower than expected and if new generation north of Kelly Lake Substation and east of Nicola Substation is deferred.

The Kelly Lake to Cheekye project is now the subject of a comprehensive public consultation and route investigation process. This process, which includes environmental and engineering studies, is intended to define feasible routes for the proposed transmission line, to identify potential social and ecological impacts that could be caused by the construction and operation of the line and to determine ways of avoiding or mitigating those impacts. The results of these studies will determine under what conditions the project is environmentally and technically feasible. Once these conditions have been applied to the design and the routing, and the need for the project has been confirmed, B.C. Hydro will apply for an Energy Project Certificate to the Minister of Energy, Mines and Petroleum Resources requesting approval to construct the project.

1. Introduction

B.C. Hydro's mission is to support the economic growth of British Columbia through the efficient supply of electricity. As electricity consumption grows in the Lower Mainland and on Vancouver Island, it is imperative that the major transmission system bringing electricity to these regions be reinforced to maintain system reliability; that is, to maintain an assured supply of electricity.

This report outlines B.C. Hydro's planning process for major transmission projects and explains how that process led to more detailed studies for reinforcing the Interior to Lower Mainland Transmission System with a second 500 kV single circuit transmission line from Kelly Lake Substation near Clinton to Cheekye Substation near Squamish.

The following pages contain brief descriptions of:

* a typical electrical transmission system;

* B.C. Hydro's existing major transmission system;

* the forecast of electricity demand which is driving the need for transmission system reinforcement;

* the resource plan to meet the growing demand for electricity;

* the transmission planning process which determines what system reinforcements are needed; and,

* the planned second Kelly Lake to Cheekye 500 kV transmission line.

For further information please contact:

Manager, External Relations
B.C. Hydro
970 Burrard Street, HO-18
Vancouver, B.C.
V6Z 1Y3

Or call the toll free project information number:

1-800-663-1377

If in the Lower Mainland, call: 663-3616

2. Electrical Transmission Systems — What they are and how they are planned

Electric transmission systems are complex networks of transmission lines that deliver electricity from generating plants to places where the electricity is consumed. This section summarizes information not only on the transmission lines but also on the various stations in which the lines terminate and on the equipment located in those stations. More technical details can be found in the Glossary of Terms at the end of this report.

2.1 Elements of a Transmission System

Figure 1 is a schematic drawing of the basic elements of an electrical system from the generation plant to an individual customer. The transmission elements include the major transmission lines which transmit electricity directly from the generating plants to large central substations; the area transmission lines which take the electricity from the central substations to large industrial customers and to local area and distribution substations; and the distribution lines which deliver the electricity from the area and distribution substations to smaller industrial, commercial and residential customers.

Major transmission lines typically operate at the highest voltages[2] in the system while area transmission lines operate at intermediate voltages and distribution lines at the lowest voltages. B.C. Hydro's transmission system consists of over 17,000 km of lines operating at voltages from 500 kV[3] down to 69 kV.

The primary purpose of the major transmission system is to reliably[2] transmit electricity from remote generation resources to centres of high electricity consumption. This requires that the system voltages remain relatively constant during varying levels of electricity consumption, when lines and equipment are out of service and during sudden line outages.

Since the major generation resources in British Columbia are quite distant from where most of the electricity is consumed, high transmission voltages are required to economically transmit that electricity. The long distances and the large variability in consumption patterns also require that equipment be installed to control system voltages. Some of the key elements of the major transmission system are briefly described below.

Generators - The first component of any electrical system is the source of electricity; in this case, the generators at the hydroelectric dams. The water in the reservoirs flows through turbines which turn the generators, producing electricity. In addition to producing the electricity to drive motors and other electrical devices, generators also help control system voltage levels.

Transformers - Transformers are used to change transmission line voltages from one level to another. Generators produce electricity at low voltages. Transformers at the generating plants step-up this low voltage to a higher voltage (up to 500 kV in the B.C. Hydro system) for efficient transmission of electricity over long distances. Transformers are also used in substations (see below) to transform, or step down, the major transmission voltages to area transmission and distribution voltages.

[2] See Glossary.
[3] Kilovolt (kV) or thousand volts, the operating voltage of the line; see Glossary.

High Voltage Major Transmission Lines - The high voltage electricity from the generating stations is transmitted over the high voltage major transmission lines. These lines can transmit more electricity over longer distances than lower voltage lines and can do so with lower transmission losses.[4]

Substations - Substations interconnect transmission circuits and may include transformers for changing voltage levels. These stations also contain circuit breakers[4] and other equipment necessary to disconnect failed lines or transformers from the system.

Series Capacitors - Series capacitors[4] are inserted into transmission lines to increase the amount of electricity that can be transmitted and to help maintain acceptable system voltage levels.

Voltage Control Equipment - Static var compensators[4] (SVCs), synchronous condensers[4], shunt capacitors[4] and shunt reactors[4] are installed in substations to help control system voltage levels. During periods of low electricity consumption, system voltages tend to rise and operators switch in shunt reactors which lower system voltages to normal levels. As consumption increases and system voltages begin to drop below normal levels, the shunt reactors are switched out and shunt capacitors are switched in to raise voltage levels. Synchronous condensers and SVCs provide automatic continuous voltage control during sudden line outages.

2.2 Planning the Interior to Lower Mainland Transmission System

System transmission planning involves technical and economic studies to determine the best way to reinforce the system to accommodate increases in consumption and generation. The selection of options should be flexible enough to cover some of the uncertainties associated with such factors as the cost of money, changing growth rates and the range of alternatives in the resource plans. A significant part of the work of planning the Interior to Lower Mainland transmission system[4] is concerned with ensuring that proper system voltages can be maintained during normal and emergency conditions.

2.2.1 Technical Studies

An electric transmission system is technically complex and computer simulation studies must be conducted to predict its behaviour during specific conditions. The results of these studies are used both for operating the existing system and for determining future reinforcement requirements.

The studies provide information on such electrical system quantities as electric currents[4], voltages and transmission losses. These studies are used to ensure that equipment is not subjected to higher than its rated operating levels of current or voltage, that system voltages remain within acceptable limits and that voltage stability[4] is maintained following the loss of a critical system component such as a major transmission line.

The technical studies revealed that the primary factor limiting the transmission capability of the Interior to Lower Mainland transmission system is voltage stability.

[4] See Glossary.

2.2.2 Economic Studies

The economics of different transmission system reinforcement plans are analyzed using discounted cash flow[5] methods. Economic assessments compare options considering: capital costs, interest during construction, corporate overhead, depreciation charges over the expected useful lifetime of each component, expected annual operating and maintenance costs, taxes, cost of transmission losses, inflation and interest rates.

2.3 Planning for System Performance

In general, B.C. Hydro's major transmission system must continue to operate properly when a single element of the system fails (e.g., a transmission line). It must withstand this loss during times of peak demand[5] for electricity and other high stress conditions such as maximum output from any group of generating plants. During these conditions the system must have the following performance characteristics:

* no interruption of electricity to customers
* no loss of generation
* all equipment operating within design limits
* system voltages remain within acceptable limits

Transmission lines must be operated to maintain minimum safe conductor-to-ground clearances. As conductors heat up they get longer and conductor-to-ground clearances are reduced. Because electric current flow increases conductor temperature, transmission line capacity can be limited by ground clearance considerations during hot summer weather.

The system must maintain voltage stability during conditions such as periods of high electricity consumption. Voltage stability indicates the system is capable of withstanding a disturbance without voltages collapsing or dropping to extremely low levels. Voltage instability can result in widespread blackouts caused by cascading[5] tripouts[5] of transmission lines operating beyond their emergency limits.

As a member of the Western Systems Coordinating Council (WSCC)[5], B.C. Hydro must demonstrate that a disturbance within the B.C. Hydro system will not adversely affect the systems of neighbouring utilities.

[5] See Glossary.

3. The Existing Major Transmission System

Figure 2 is a schematic map of B.C. Hydro's existing major transmission system. The primary generation resources are in the north on the Peace River and in the southeast on the Columbia River system. Most electricity consumption is in the Lower Mainland and on Vancouver Island. As can be seen in Figure 2, most of the major transmission lines are routed from the hydroelectric generating plants in the north and southeast to the southwest corner of the province where most of the electricity is consumed. Electricity is supplied to the Lower Mainland and Vancouver Island from the Peace River through Kelly Lake Substation and from the Columbia River system through Nicola Substation.

The B.C. Hydro system is interconnected with the Bonneville Power Administration (BPA) system in the United States by two 500 kV transmission lines from Ingledow Substation in Surrey to BPA's Custer Substation south of Blaine, Washington, and by two 230 kV transmission lines in eastern B.C. These intertie lines provide for emergency support from BPA during disturbances in the B.C. Hydro system. They are also used throughout the year to export a firm supply[6] of electricity to Seattle City Light[7] and during periods of low domestic consumption the intertie lines can be used to export up to 2300 MW[6] of non-firm electricity. This export, as well as the electricity consumed in the Lower Mainland and on Vancouver Island, must flow through the Interior to Lower Mainland transmission system; as a consequence, that system is heavily used a large percentage of the time.

4. The Forecast of Future Electricity Demand

The most significant factor in determining when new generation and transmission facilities are needed is the forecast of future electricity demand. Figure 3 shows the 1989 forecast of future growth in peak electricity demand. This forecast was developed as a range of 'possible futures' based on such factors as expected population growth, future energy[6] prices and various economic development forecasts for the province.[8] The Probable forecast of approximately 2.7% average growth in peak demand per year for the next ten years is represented by the middle line in Figure 3. The Probable forecast is the 50th percentile. That is, there is a 50% chance the actual demand will be at or below the Probable forecast. There is a 95% chance the actual demand will be at or below the levels represented by the 95th percentile forecast.

The demand for electricity in individual areas of the province is expected to grow at rates different than the province as a whole and this must be considered when planning future transmission additions. For instance, the Lower Mainland and Vancouver Island regions now have a total peak demand of about 5400 MW (approximately 70% of the system total) and these regions are expected to account for approximately 75% of the total probable forecast growth in demand over the next ten years with very little change expected in that relative amount over the next twenty years. This means there is a 50% chance the total demand for electricity in the Lower Mainland and Vancouver Island regions will exceed 7000 MW by about the end of the century.

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[6] See Glossary.

[7] The contract with Seattle City Light (SCL) is for a guaranteed supply of electric power which ranges from 150 MW in the summer up to 300 MW in the winter (B.C. Hydro's peak period). This came about when SCL agreed not to raise their Ross Dam and flood part of the Skagit Valley in British Columbia.

[8] Historically, there has been a close correlation between growth of Gross Provincial Domestic Product and growth in electrical demand. While there is no reason to believe that this historical relationship will continue indefinitely, there is also no reason to expect a marked deviation over the forecast period.

5. The Resource Plan

As electricity consumption grows, resources must be developed to supply the increase. Each year a resource plan is proposed based on the latest forecast of future electricity demand.

Following are brief summaries of the new resources now being considered to provide electricity for use by B.C. Hydro's customers. There are sufficient resources listed to meet the Probable forecast shown in Figure 3. Some developments can be advanced or delayed if actual growth is above or below the Probable. More information on resource options can be found in the latest resource plan report.

Power Smart Programs - These are on-going, customer- oriented, energy conservation programs which reduce future growth of consumption by encouraging more efficient use of electricity. This benefits both the customer (through lower electricity bills) and B.C. Hydro (by postponing the need for new facilities, thus lowering financial commitments and delaying environmental impacts).

Resource Smart Initiatives - These on-going programs and projects are intended to make existing generation and system facilities more efficient in order to obtain significant additional energy from the B.C. Hydro system and allow development of new facilities to be postponed. Some of the proposed Resource Smart projects are listed under Lower Columbia Development, below.

Independent Power Producers - Independent power production is defined as electricity generation by a privately owned facility which can be connected to the B.C. Hydro system for the purpose of selling electricity. The Independent Power Producer program will provide resource options which will help B.C. Hydro meet its customer requirements while contributing to the province's economic development.

Coordination & Purchases

A number of possible coordination and purchase agreements with neighbouring utilities and a large industrial firm offer a potentially attractive combination of flexibility and fairly-priced energy to B.C. Hydro.

TransAlta

B.C. Hydro, which operates a system that relies predominately on hydroelectric generation, is negotiating for the purchase of electricity and coordination of generation resources with TransAlta in Alberta, which operates a system that relies predominately on thermal generation. These negotiations are now in their early stages but agreements are anticipated which would utilize the different characteristics of the two systems to the mutual benefit of customers in British Columbia and Alberta.

Bonneville Power Administration

Coordination with Bonneville Power Administration (BPA), which operates a large electrical system in the northwest part of the United States, would make it possible for B.C. Hydro to more effectively manage reservoir storage on the Peace and Columbia rivers. Current negotiations are focused on reaching a limited coordination agreement for the operation of Canadian and American reservoirs on the Columbia River this year. B.C. Hydro and BPA have agreed to study other alternatives for future coordination when the first agreement is in place.

Alcan Purchase

Alcan is proceeding with construction of its Kemano Completion Project southeast of Kitimat for service by 1995, ahead of Alcan's requirements for industrial purposes. Detailed negotiations for the purchase by B.C. Hydro of electricity that will be generated by the Kemano Completion Project and for coordination of reservoir operations have been completed and a final agreement on purchases and coordination was signed on 27 February 1990.

Downstream Benefits Arising from the Columbia River Treaty – The Canadian entitlement to downstream benefits resulting from the operation of water storage in the reservoirs at the existing Duncan, Keenleyside and Mica dams under the Columbia River Treaty was sold to the United States for a period of 30 years from the commencement of operation of each project. Those downstream benefits will revert to British Columbia gradually, starting in 1998/99.

Lower Columbia Development – The Lower Columbia Development consists of seven potential hydroelectric facilities located in the general area of Trail and Castlegar in the southeastern part of the province: Keenleyside power plant project, Waneta power plant expansion, addition of a fourth generating unit at Seven Mile power plant, Brilliant power plant expansion, Duncan power plant project, Border project and Murphy Creek project. All of these but the Border and Murphy Creek projects are Resource Smart initiatives. All seven of these are being considered because of their relatively low environmental impact and because they constitute the final stage of the 'two river policy' that was initiated by the Province in the early 1960s.

Peace Site C – Site C, near Fort St. John, would be the third dam on the Peace River (W.A.C. Bennett and Peace Canyon dams near Hudson's Hope are already producing electricity). Should public consumption of electricity continue to grow at the current forecast rate, electricity from Site C could be required by approximately the turn of the century.

Additional Resources Beyond 2000 – Selection of other resource additions to the system has not been made. The choices will be affected by actual growth and forecasts of growth over the next few years and by the effectiveness of the programs described above.

As can be seen from this list, resource options other than the development of large generating facilities are taking precedence in the preparation of the Resource Plan. Still, virtually all these resources are located quite far from where most of the electricity is consumed. Therefore, there is a continuing need to reinforce the major transmission system to reliably deliver electricity from the new resources to the growing customer requirements.

6. Planning Major Transmission into the Lower Mainland

The primary planning and design requirements for the transmission system from Kelly Lake and Nicola substations into the Lower Mainland are determined by electricity consumption in the Lower Mainland and on Vancouver Island and by the location and size of the generation resources serving those regions. Over the next ten years, domestic consumption in the Lower Mainland and on Vancouver Island is expected to grow by almost 1900 MW. Almost 350 MW of that growth is expected to be conserved by Power Smart Programs leaving more than 1550 MW to be supplied through the Interior to Lower Mainland transmission system from remote generation sources. For this system it is voltage stability which most significantly limits the amount of electricity that can be transmitted. That is, the system voltage levels must remain within acceptable limits following a severe disturbance. Voltage instability can lead to the electrical break-up of the system and blackouts. The Interior to Lower Mainland system will require reinforcing to reliably deliver the additional electricity to serve the increasing levels of consumption in the south west portion of the province.

6.1 Existing System Restrictions

The Interior to Lower Mainland transmission system now has essentially no spare capacity. There are two significant restrictions on this system. One is a conductor-to-ground clearance restriction in the older 500 kV transmission lines and the other is voltage stability.

Conductor-to-Ground Clearance Restrictions - Recent surveys of the existing Peace 500 kV transmission lines revealed that clearances between the electrical conductors and the ground severely limit output of the Peace River generators during hot summer weather. The Peace transmission system is not adequate for expected future growth in electricity demand and generating plant additions. Uprating the Peace transmission lines, including the existing Kelly Lake to Cheekye 500 kV line, is presently under way and should be completed by the fall of 1991.

Voltage Stability Restrictions - During the next ten years the Interior to Lower Mainland transmission system will be limited by voltage stability considerations. Two high stress system conditions are studied when evaluating different plans for the reinforcement of this system during this time period:

1. Peak demand for electricity with the generation resources in the north (on the Peace River and Alcan's Kemano generation) operating at their maximum capacities; and,

2. Peak demand for electricity with the generation resources in the southeast (on the Columbia River system) operating at their maximum capacities.

6.2 Reinforcement Options

Near term solutions to the voltage stability problem are being provided by conversion of some of the generators at the Burrard Thermal Generating Plant near Port Moody to synchronous condenser operation and by the construction of the American Creek Series Capacitor Station north of Hope.

Burrard Thermal Synchronous Condensers – To help maintain voltage levels in the Lower Mainland following the loss of a major transmission line, four of the six generators at the Burrard Thermal plant have been converted to synchronous condenser operation. The remaining two units cannot be converted because they are required for back-up generating capacity. However, those two units will be placed on-line during times of peak demand for electricity for the next few years to provide needed additional voltage control.

American Creek Series Capacitor Station – The addition of series capacitors in the two Nicola to Lower Mainland 500 kV transmission lines in 1990 will help maintain acceptable voltage levels in the Lower Mainland and on Vancouver Island and will increase the transmission capacity of the system.

The system, with the reinforcements described above, will provide adequate transmission capacity until the peak domestic demand for electricity in the Lower Mainland and on Vancouver Island reaches a combined total of about 6030 MW, approximately 650 MW above present peak demand. Additional system reinforcement will be required at that time which is now expected to occur by about the year 1993.

Many options have been studied for reinforcing the Interior to Lower Mainland transmission system to increase its transmission capacity and to improve voltage stability. Voltage regulation devices, series capacitors and new transmission lines have all been considered in various combinations. The specific system reinforcement options considered beyond 1990 are listed below. Each of these additions would improve voltage stability and increase the transmission capacity of the system.

1. **Static Var Compensators:** Static var compensators (SVCs) can be installed in substations to help control voltage levels and prevent voltage collapse following sudden outages of transmission lines. The first SVC installation is now scheduled for 1993.

2. **Series Capacitors:** The option of using only series capacitors to reinforce the transmission system was considered. This option consisted of increasing the amount of series compensation of the existing four Interior to Lower Mainland 500 kV transmission lines (two each from Kelly Lake and Nicola substations) and adding series compensation to the 500 kV transmission line between Nicola and Kelly Lake, which is presently uncompensated. Installing more series compensation in the Interior to Lower Mainland transmission system would require significant changes to protective relaying equipment.[9] Also, the cost of series capacitors increases dramatically as the level of compensation increases. Providing more series compensation in these lines would be very expensive, making this option uneconomic when compared to other alternatives.

3. **Additional Transmission Lines:** Adding more transmission lines in parallel with existing transmission lines is an obvious way to increase the transmission system capability. Additional lines would improve voltage stability and increase the transmission capacity of the system. In addition, transmission losses would be substantially reduced. Several options for transmission line additions have been studied:

[9] See Glossary.

a. **Kelly Lake to Cheekye 500 kV Transmission Line** – The option of building a second 500 kV transmission line between Kelly Lake and Cheekye substations includes the installation of a series capacitor bank near the mid-point of the line, possibly at the existing Creekside Series Capacitor Station near Pemberton, depending on routing. This line would be the shortest and least costly of the alternative transmission lines into the Lower Mainland and would provide a significant increase in transmission system capability. It would also significantly reduce transmission losses. The existing 500 kV line between Kelly Lake and Cheekye is one of the most heavily used lines in the system because much of Vancouver Island's electricity flows over that line in addition to the electricity required in the Lower Mainland. The proposed second Kelly Lake to Cheekye 500 kV line would improve the reliability of supply to both the Lower Mainland and Vancouver Island.

b. **Kelly Lake to Ingledow 500 kV Transmission Line** – The route assumed for this transmission line basically follows the existing Kelly Lake to Ingledow 500 kV transmission line through the Fraser Canyon. This option would include the installation of series capacitors at or near the existing Chapmans Series Capacitor Station. Although this line would also provide a large increase in transmission system capability, it would be significantly longer and more costly than the proposed Kelly Lake to Cheekye line and less effective at reducing transmission losses. The lead time necessary to build this line is estimated to be at least three years longer than for the Kelly Lake to Cheekye line.

c. **Nicola to Meridian 500 kV Transmission Line** – It is assumed that this line would be built adjacent to the existing 500 kV line connecting Nicola and Meridian substations. It would include the provision of series capacitors at or near the American Creek Series Capacitor Station which will be completed this year. This line also would provide a substantial increase in transmission system capacity and would reduce transmission losses but it would be significantly longer and more costly than the Kelly Lake to Cheekye line. The second Nicola to Meridian 500 kV transmission line is included in the preliminary plans for the reinforcement of the eastern side of the Interior to Lower Mainland transmission system with a possible in-service date in the late 1990s.

6.3 Recommendations and Rationale

Based on the latest forecast of future electricity demand, the resource plan and transmission planning studies, the Interior to Lower Mainland transmission system will require additional reinforcement beginning in 1993. If electricity consumption continues to grow and the system is not reinforced, loss of a major transmission line during periods of high electricity consumption would result in the quick disconnection (usually automatic) of one or more generating units and the interruption of electricity to customers and an increased risk of a widespread blackout or extremely low voltages in large areas of the Lower Mainland, Northern Washington and Vancouver Island. If there can be electricity interruptions to customers in Washington because of this type of disturbance in the B.C. Hydro system, it would be a violation of the WSCC planning criteria.

The following system additions are being considered for installation starting in about 1993, possibly by the dates shown:

* 1993 Installation of a static var compensator in the Lower Mainland or on Vancouver Island;

* 1995 Construction of a second 500 kV transmission line between Kelly Lake and Cheekye substations including a series capacitor bank near the mid-point of the line, possibly at the existing station at Creekside, depending on the route selected;

* 1998 Construction of a second 500 kV transmission line between Nicola Substation near Merritt and Meridian Substation north of Coquitlam including a series capacitor bank near the mid-point of the line, presumably at the existing American Creek Capacitor Station north of Hope; and

* 2001 Installation of another static var compensator in the Lower Mainland or on Vancouver Island.

Since B.C. Hydro has no operating experience with SVCs, the above recommendations do not rely heavily on SVCs in the early years. The initial SVC installation proposed for 1993 would provide design and operating experience with these devices.

The planned second Kelly Lake to Cheekye transmission line would provide a proven means of reinforcing the system. The existing Kelly Lake to Cheekye line is one of the most heavily used 500 kV lines in the major transmission system. The new line would maintain system reliability and greatly reduce system losses which would cover, over its operating lifetime, approximately 70% of the total capital and operating costs associated with the line, based on forecast energy costs and growth in electricity demand.

The above recommendations can be rescheduled to respond to higher than expected rates of growth or the development of firm export opportunities by advancing the short lead-time SVC projects. Advancing the second Kelly Lake to Cheekye 500 kV line earlier than 1995 does not appear to be possible. Since the next resource addition is scheduled to be Alcan's Kemano Completion Project in early 1995, it is appropriate to first reinforce the western side of the Interior to Lower Mainland transmission system by adding a second Kelly Lake to Cheekye line followed later by reinforcing the eastern side of the system with a second Nicola to Meridian line. Lower growth rates would result in the postponing and possible relative rescheduling of these projects.

7. The Second Kelly Lake to Cheekye 500 KV Transmission Line

7.1 Background

During the last half of the 1970s, the forecasts of electricity demand indicated that some new system additions would soon be required to bring more electricity into the Lower Mainland to serve the growing demand there and on Vancouver Island. By going through a study process similar to what has been outlined in this report, a decision was made then that a second Kelly Lake to Cheekye 500 kV transmission line was the best choice to meet that requirement. The line was initially scheduled to be completed in 1986. However, because of the high long-range forecast at that time, the plan was changed to a double circuit 500 kV line with a 1987 in-service date. That is, the supporting towers would be constructed so they could support the conductors for two 500 kV circuits rather than just one.

By 1980, however, there were indications that the rate of growth was slowing and the project was rescheduled to 1988, then to 1989. In 1982 it was again rescheduled for completion in 1990 as a single circuit line. The long range forecast had dropped enough by 1983 that plans for the line were postponed indefinitely.

Within the last two years an increasing forecast of electricity demand has resulted in a comprehensive review of the system plan aimed at determining what additions would be needed within the next ten to twenty years to meet the increase. The system additions and improvements discussed in Section 6 are buying time before the next transmission line must be built into the Lower Mainland but options and time appear to be running out. As a consequence, a second 500 kV transmission line between Kelly Lake and Cheekye substations is once again being considered.

7.2 Project Description

The new line would consist of a single circuit, 500 kV, steel tower transmission line between Kelly Lake and Cheekye substations. The line would be approximately 200 km long, depending on the route selected. Both self- supporting and guyed structures would be used in the construction of the second 500 kV line with the requirements of terrain, climate and span length determining which type of structure is appropriate in each location. However, the choice of tower types has not yet been determined. Schematic drawings of the types of structures being considered are shown in Figure 4. The structures shown in Figure 4a are similar to those of the existing 500 kV line between Kelly Lake and Cheekye. Those shown in Figure 4b would allow a reduced right-of-way width requirement and correspondingly less clearing as well as some potential electrical benefits but are taller and would tend to be more visible. It is possible that both types of structures could be used with the choice along each section of the line depending on local factors.

When this project was planned a few years ago, one of the options was for double-circuit construction. Because the forecast is now relatively low, there appears to be no need for a third 500 kV line between Kelly Lake and Cheekye within the foreseeable future and it would not be economic to build a double circuit line at this time.

In the early 1980s, plans were announced for a new substation, called Creekside, to be constructed north of Mount Currie. There are now no plans for a new substation between Kelly Lake and Cheekye. However, to enable the new line to transmit the maximum amount of electricity, series capacitors would be inserted near the mid-point of the line, possibly at the existing Creekside Capacitor Station northeast of Pemberton, depending on the selected route.

A route for the new line has not been selected. When this project was first considered, the plan was to route the new line parallel and adjacent to the existing 500 kV line from Kelly Lake Substation to the Bridge River area. From there, the intention was to remove one of the existing 230 kV lines, which was built in the 1940s, and utilize that right-of-way for the new 500 kV line from Bridge River to Cheekye Substation. Comprehensive route studies were carried out at that time which identified areas where deviations from the right-of-way of the 230 kV line offered some land use or other social and environmental advantages. In particular, deviations were recommended from south of Anderson Lake to past Gates Lake, in the Pemberton and Whistler areas and in the Cheakamus Canyon. However, before those options could adequately be reviewed with the public the project was postponed.

7.3 Project Studies and Schedule

New route studies are now in progress which are using relevant information from the previous studies but are not limited to those findings. More environmental assessment studies are being carried out to identify feasible route options and potential ecological and social impacts of the new line and to determine ways of avoiding or mitigating those impacts. Figure 5 shows some of the possible routes being considered. The environmental studies are being closely coordinated with engineering studies which address line security and cost. Public consultation is an integral part of the process.

A project schedule which would meet an in-service date as early as the fall of 1995 is outlined in Figures 6 and 7. Figure 6 covers activities during Phase 1, the planning and development phase, and Figure 7 covers activities during Phase 2, the design and construction phase. Although public consultation is an on-going activity that will continue throughout both phases, particular emphasis is being placed on public involvement during Phase 1, as identified in the schedule.

The results of these activities will determine whether the project is environmentally and technically feasible. If it is, and if growth trends continue to demonstrate a need for system reinforcement, then B.C. Hydro will apply for an Energy Project Certificate to the Minister of Energy, Mines and Petroleum Resources requesting approval to construct the project.

Glossary of Terms

Alternating Current (AC) is electric current which alternates its direction of flow periodically. The electricity supplied to homes in North America alternates at a frequency of 60 cycles per second or Hertz (Hz).

Ampere (A) or Amp is a unit for measuring electric current flow. The current that flows in a typical 60 watt household light bulb is about one-half ampere. Very high currents are measured in kiloamperes or kiloamps (abbreviated as kA). One kiloamp is equal to one thousand amps.

Capacitors are connected together in series and parallel to form the large capacitor banks used in electrical transmission systems. Capacitor banks are connected in series with transmission lines to reduce transmission system impedance (see below). They are also connected in 'shunt' (i.e., between a live conductor and the ground or between live conductors) to help raise system voltages.

Cascading (see Tripout) refers to multiple tripouts of generators and transmission system equipment caused by the loss of one or more elements which results in the automatic tripping out of other equipment which would otherwise have to operate beyond its emergency limits and that, in turn, can cause further tripouts.

Circuit Breakers are fast switches used to interrupt electric current flow. The high voltage circuit breakers used in major transmission system substations are capable of interrupting electric current of tens of thousands of amperes.

Current (see Alternating Current and Ampere) is the flow of electrons in electrical equipment such as transmission lines. Electric current is measured in units called amperes.

Demand (see Electricity Demand and Peak Demand)

Discounted Cash Flow is a method of economic analysis which takes proper account of interest and inflation rates when determining the total value of a series of expenditures and earnings over a period of time.

Electric Energy (see Watt Hour) is the amount of electricity produced, transmitted or consumed in a given period of time. A 100 watt light bulb consumes 100 watt hours of electricity for each hour it is turned on.

Electricity Demand is the amount of electricity (usually measured in megawatts -see Watt) being consumed at any time by customers connected to an electrical transmission system.

Energy (see Electric Energy)

Firm Supply is the level of supply of electricity a customer can count on during periods of peak demand for electricity with one system element out of service.

Impedance is the property of a conductor or circuit which resists, or impedes, the flow of an electric current.

Interior to Lower Mainland Transmission System can be defined as those major transmission lines feeding into the large Lower Mainland substations (Cheekye near Squamish, Meridian north of Coquitlam and Ingledow in Surrey) from Kelly Lake Substation near Clinton and Nicola Substation near Merritt. It also includes the 500 kV transmission line between Kelly Lake and Nicola.

kV is the abbreviation for kilovolt (see Volt).

Losses (see Transmission Losses)

MW is the abbreviation for megawatt (see Watt).

Peak Demand (see Electricity Demand) is the highest level of electricity consumption experienced by an electrical system in a given period of time (e.g., day, month, season or year).

Protective Relaying Equipment detects faults in the system and initiates the disconnection of the faulty devices to minimize the damage to those devices and to protect other devices from damage.

Reactors are made up of a ferrous (i.e., magnetic) core wound with many turns of copper wire. Reactors come in a large range of sizes and types. Very large reactors are used in large electrical systems. They are connected in series with distribution lines to limit short circuit current levels. They are also connected in 'shunt' (i.e., between a live conductor and the ground or between live conductors) to help lower system voltages during periods of low electricity consumption.

Reliability is a measure of the continuity of electric service over a long period of time.

Series Capacitors (see Capacitors)

Shunt Capacitors (see Capacitors)

Shunt Reactors (see Reactors)

Static var compensators (SVCs) are devices which are used to control transmission system voltages. An SVC is made up of capacitors, reactors and solid state switches called thyristors. The very quick response of the thyristors permits an SVC to quickly react to, and compensate for, events which cause changes in system voltage. The thyristors also permit the output of the SVC to be continuously varied throughout its range rather then adjusted in large blocks as is the case for banks of shunt capacitors or reactors which are switched in and out using circuit breakers.

Synchronous Condensers are rotating machines which serve the same purpose as static var compensators by providing fast control of system voltages to improve system voltage stability. This fast voltage control together with their rotational inertia also aids system transient and dynamic stability.

Transmission Losses are energy losses in electrical systems which result from the heating caused by the flow of electric current through the conductors.

Tripout (see Cascading) is the disconnection of an electrical system element (e.g., transmission line, transformer, generator, etc.) by the action of circuit breakers usually initiated automatically by protective relaying equipment.

Volt (V) is the unit for measuring voltage (see below). Very high voltages are measured in kilovolts (abbreviated as kV). One kilovolt is equal to one thousand volts.

Voltage (see Volt) is the electric 'force', measured in volts, which causes current, measured in amperes (see above), to flow in electrical circuits.

Voltage Stability is the ability of the electrical transmission system to withstand the failure of a system element such as a transmission line or transformer; an unstable system can result in voltage collapse at the receiving end of the system which can lead to either widespread blackouts or large areas of very low voltages. Very low voltages can damage equipment, such as motors, due to overheating caused by the resulting high electric current flow.

Watt (W) is the unit for measuring the rate of generating, transmitting or consuming electricity. High rates of consumption are measured in kilowatts (abbreviated as kW), megawatts (MW), and gigawatts (GW). One kilowatt is equal to one thousand watts, one megawatt is equal to one thousand kilowatts and one gigawatt is equal to one thousand megawatts.

Watt Hour (W.h) is the unit of measure for electrical energy or work. A 100 watt light bulb operating continuously for ten hours will consume one thousand watt hours (or one kilowatt hour, kW.h) of electricity. A gigawatt hour is one million kilowatt hours.

WSCC -The Western Systems Coordinating Council is an organization of over 60 electric utilities in two western provinces of Canada, 14 western states of the United States and the northern portion of Baja California, Mexico. The WSCC provides a forum for the coordination of the planning, design and operation activities of its member utilities. The WSCC is one of nine regional councils which comprise the North American Electric Reliability Council (NERC). The function of NERC is to coordinate, promote and communicate reliability matters for North America's electric utilities.

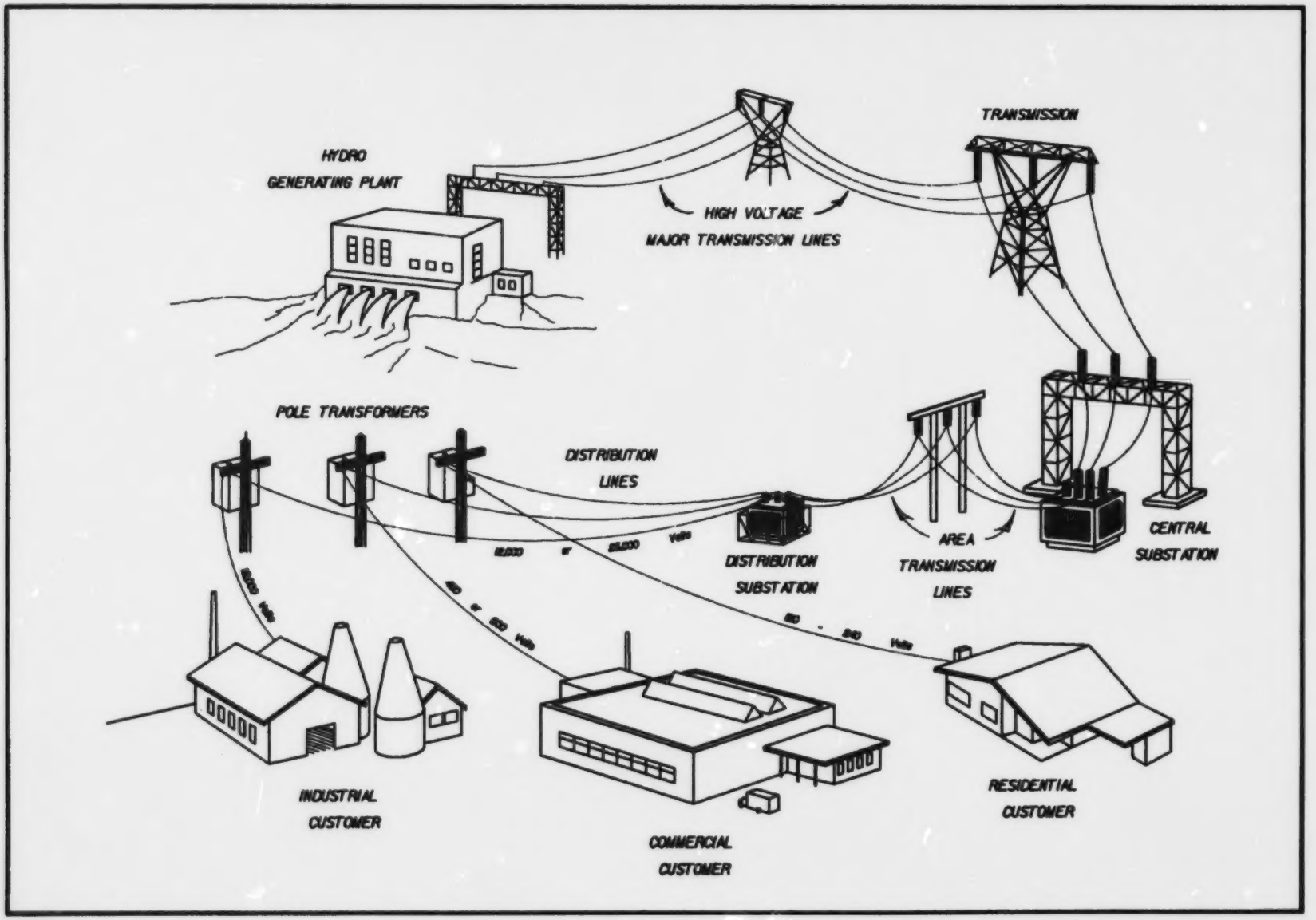


FIGURE 1 - BASIC ELEMENTS OF AN ELECTRICAL SYSTEM

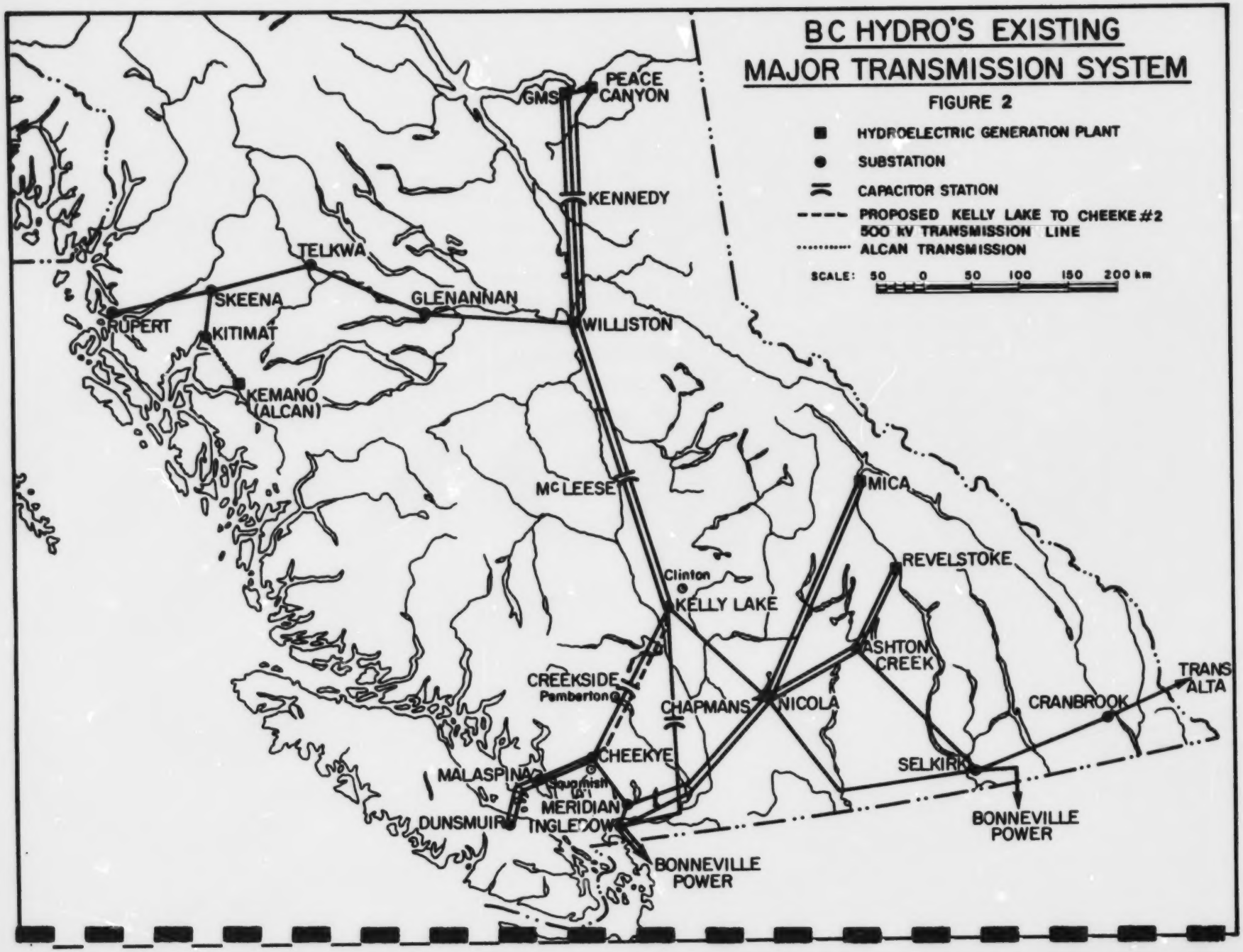
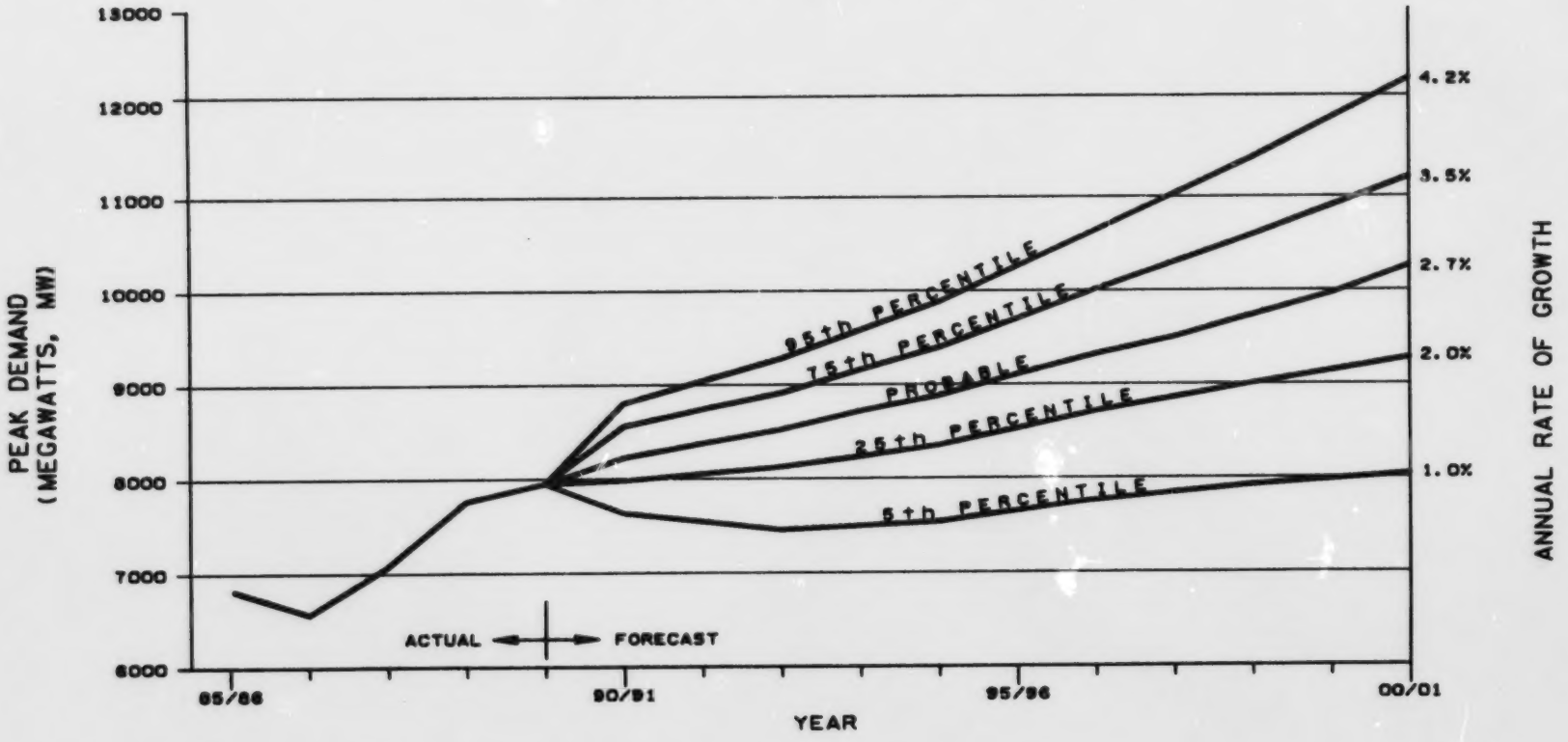

BC HYDRO'S EXISTING
MAJOR TRANSMISSION SYSTEM
FIGURE 2
HYDROELECTRIC GENERATION PLANT
SUBSTATION
CAPACITOR STATION
PROPOSED KELLY LAKE TO CHEEKE #2
500 kV TRANSMISSION LINE
ALCAN TRANSMISSION
SCALE: 50 0 50 100 150 200 km
GMS
PEACE CANYON
KENNEDY
TELKWA
SKEENA
GLENANNAN
RUPERT
KITIMAT
WILLISTON
KEMANO (ALCAN)
McLEESE
MICA
REVELSTOKE
Clinton
KELLY LAKE
ASHTON CREEK
CREEKSIDE
Pemberton
CHAPMANS
NICOLA
CRANBROOK
TRANS ALTA
CHEEKYE
SELKIRK
MALASPINA
Squamish
MERIDIAN
DUNSMUIR
INGLEDOW
BONNEVILLE POWER
BONNEVILLE POWER

FIGURE 3

1989 B.C. HYDRO FORECAST OF PEAK ELECTRICITY DEMAND

(includes firm commitments to West Kootenay Power, Seattle City Light and Energy Plus customers; Power Smart conservation has been deducted)



Basic Structure Types
Kelly Lake - Cheekye
500 kV Transmission Project

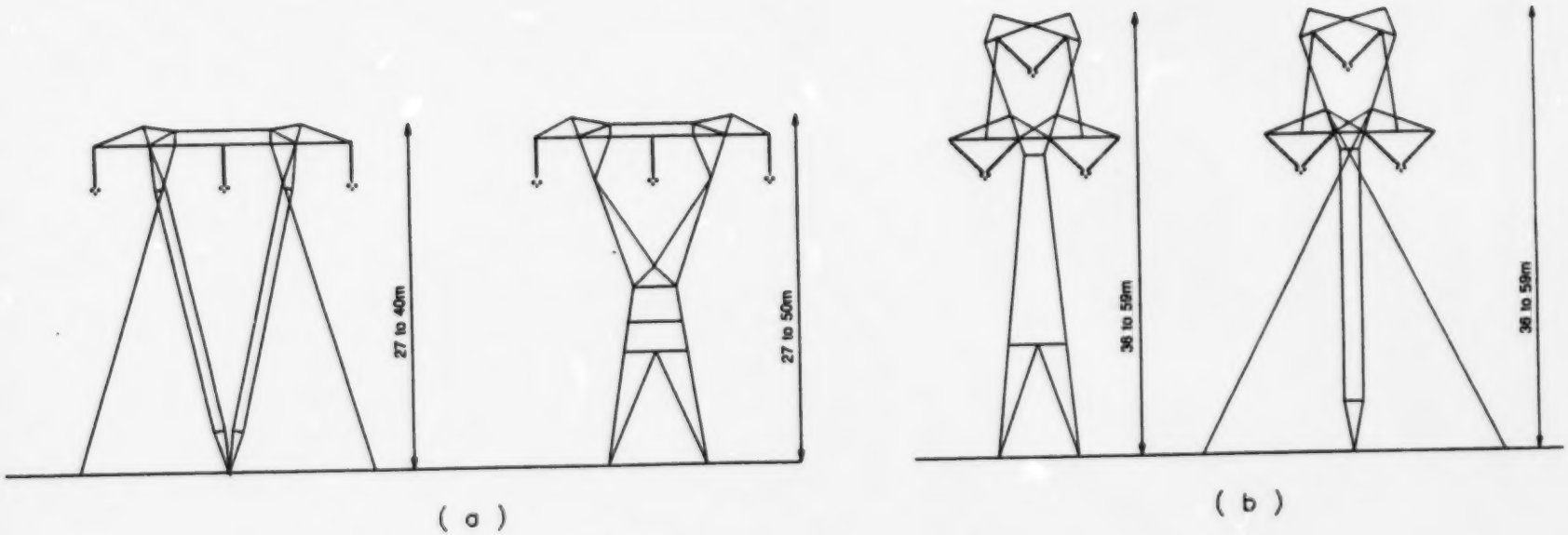


Figure 4

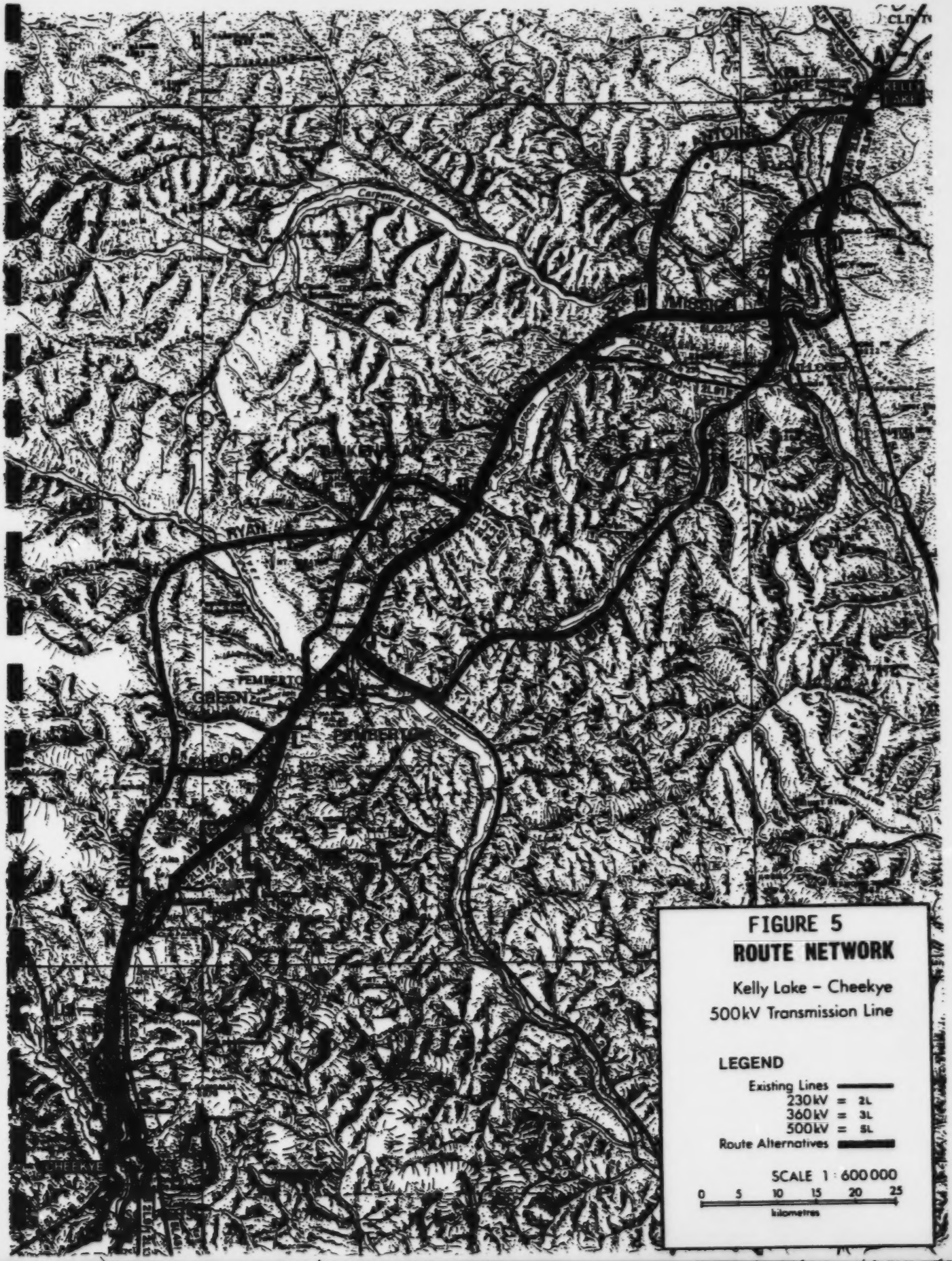


FIGURE 5
ROUTE NETWORK

Kelly Lake – Cheekye
500kV Transmission Line

LEGEND

Existing Lines
230kV = 2L
360kV = 3L
500kV = 5L
Route Alternatives

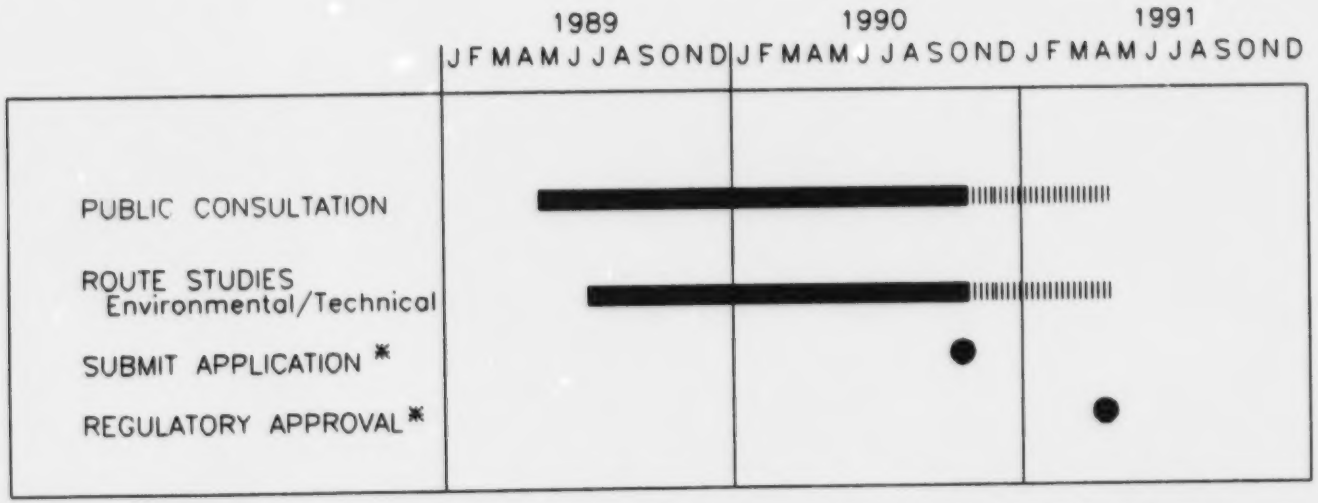
SCALE 1 : 600 000

0 5 10 15 20 25
kilometres

FIGURE 6

KELLY LAKE – CHEEKYE
500 kV TRANSMISSION LINE PROJECT
PROPOSED PROJECT SCHEDULE

PHASE 1
PLANNING AND DEVELOPMENT


1989
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J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
PUBLIC CONSULTATION
ROUTE STUDIES
Environmental/Technical
SUBMIT APPLICATION *
REGULATORY APPROVAL *

* The Project Prospectus dated September 1989 indicated an April 1990 date for submission of an Energy Project Cerificate (EPC) application with expected regulatory approval about 6 months later. However some of the Phase 1 activities have taken longer than foreseen. Therefore the earliest anticipated date for submission of an EPC application is now October 1990, with expected regulatory approval in April 1991.

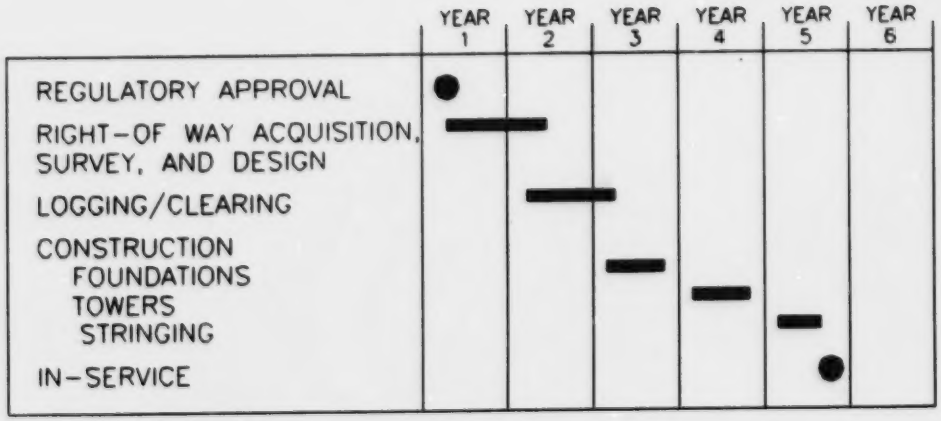
FIGURE 7

KELLY LAKE – CHEEKYE
500 kV TRANSMISSION LINE PROJECT
PROPOSED PROJECT SCHEDULE

PHASE 2
DESIGN AND CONSTRUCTION

NOTES

- Begins with regulatory approval (see comments on Phase 1 schedule)
- Entails right-of-way acquisition, survey, design, clearing, and construction
- Based on Phase 1 schedule, the earliest in-service date would be late 1995
- Actual in-service will be determined it depends on a number of factors such as; actual load growth experienced, duration and results of public consultation program, etc



BC hydro

Preliminary Planning Report

Kelly Lake to Cheekye Substation Second 500 kV Transmission Line

May 1990

proud of our Service

Canadian Cataloguing in Publication Data
Main entry under title:
Kelly Lake Substation to Cheekye Substation
second 500 kV transmission line preliminary
planning report

ISBN 0-7726-1090-8

1. Electric lines - British Columbia - Squamish - Lillooet.
2. Electric power transmission - British Columbia - Squamish-Lillooet I. B.C. Hydro

TK3144.K443 1990 621.319'13 C9092085-8

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Errata Sheet

Please note the following corrections for:
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Report No. ER - 90 - 02

BC hydro

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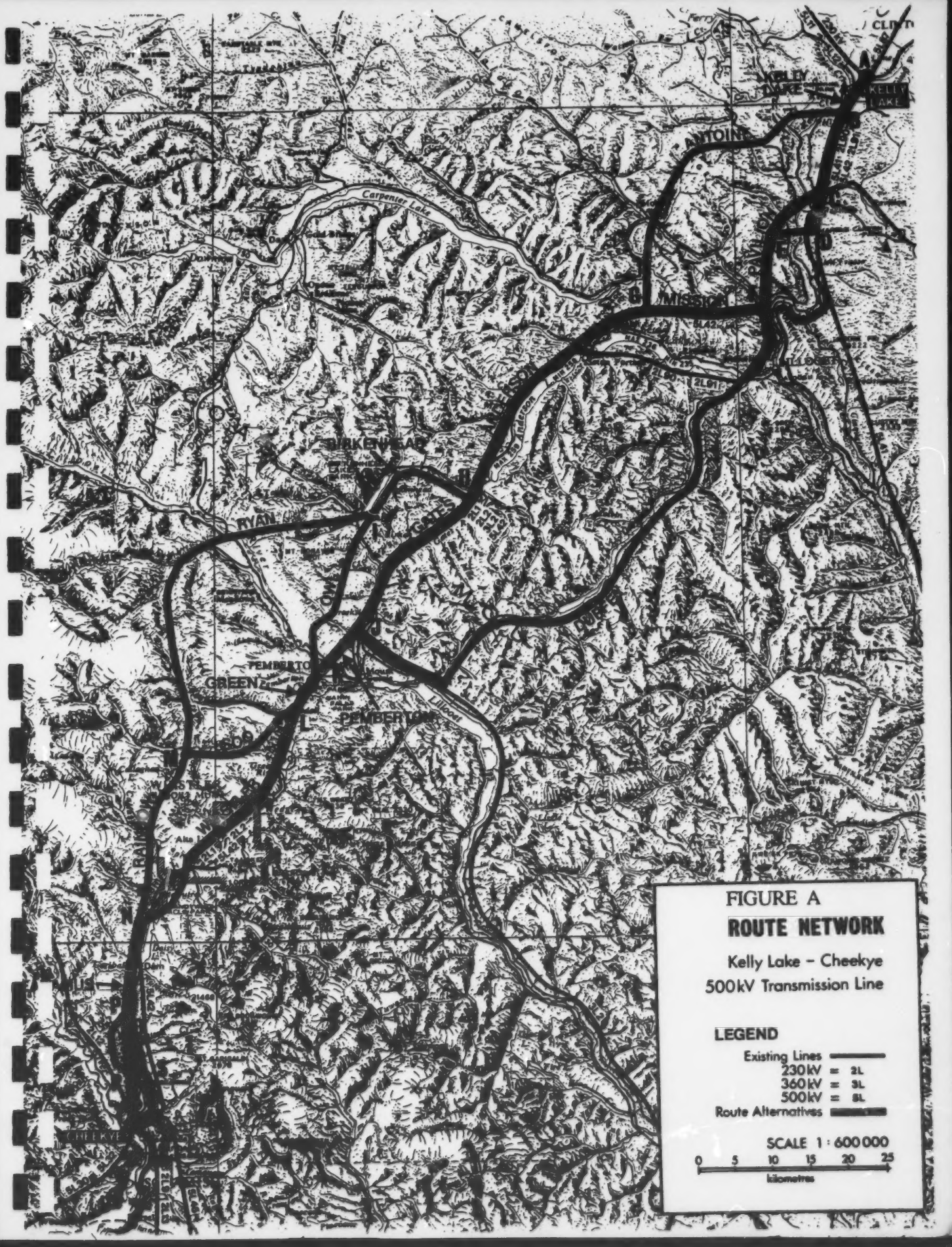

FIGURE A

ROUTE NETWORK

Kelly Lake – Cheekye
500kV Transmission Line

LEGEND

Existing Lines
230kV = 2L
360kV = 3L
500kV = 5L
Route Alternatives

SCALE 1 : 600 000

0 5 10 15 20 25
kilometres

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PRELIMINARY PLANNING REPORT

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EXECUTIVE SUMMARY

The project under study is the design and construction of a single circuit 500 kilovolt (kV) transmission line (Circuit 5L46) from Kelly Lake substation, near Clinton, to Cheekye substation, near Squamish. Part of the project is the removal of the existing 230kV transmission line (Circuit 2L1) from Shalalth to Cheekye making its right-of-way (ROW) available for use by 5L46, where appropriate.

B.C. Hydro initiated new environmental and technical studies of this project in 1989, and a related public consultation program. The studies are now nearing completion and the first round of public consultation was completed in the fall of 1989. This report presents the findings of the studies and public consultation.

The consultation program included meetings with all elected representatives in the area, except several Indian Band Councils, and eight Open Houses for the public. The Lillooet Tribal Council has advised B.C. Hydro that it will propose "a structure for negotiations" and is considering suggestions discussed in meetings with B.C. Hydro regarding the project. The Mount Currie Band Council has informed B.C. Hydro of its opposition to the project.

The main opinions, of the environmental consultants and the public, expressed to date are:

1. The use of the Antoine, Duffey, Birkenhead, Owl, and Ryan segments is not favored for environmental and/or social reasons.

The Squamish Lillooet Regional District, Village of Lillooet, and Mount Currie Indian Band have advised they oppose use of the Duffey segment. The Regional District strongly favors use of the existing corridor.

Removal of these segments from the network results in use of the existing corridor (i.e. following 5L42 from Kelly Lake to Seton Portage, and 2L2 and 5L42 from Seton Portage to Cheekye.)

2. General agreement has not yet emerged as to whether the project should bypass the Resort Municipality of Whistler or replace 2L1 in the transmission corridor through Whistler. To bypass Whistler would reduce visual impacts in Whistler to a limited extent while traversing areas of possible future importance to Whistler for recreation.

3. It is the opinion of the environmental consultants that use of the 2L1 ROW in the lower Cheakamus Valley has less environmental impact than use of alternate options, subject to an adjustment at the south end to avoid the North Vancouver Outdoor School. Further analysis and discussions are required before a route can be determined for that area north of the Outdoor School, where residents are opposed to use of the existing ROW.

It is B.C. Hydro's intent to assess conclusions reached so far by release of this report to government agencies and the public, by discussion with the Indian Bands, and further consultation with the public. Barring major changes in public opinion, or emergence of presently undisclosed contrary opinion, it is B.C. Hydro's intent to apply for an Energy Project Certificate to construct the project in the existing corridor, except that no decision on route is yet possible at Whistler and further study is required in the Lower Cheakamus. All options under study in the Lower Cheakamus will avoid the North Vancouver Outdoor School.

SECTION 1.0 INTRODUCTION

1.1 Purpose of Report

This report has been prepared by B.C. Hydro to describe the present status of the environmental and technical aspects of planning and design for the second Kelly Lake to Cheekye 500kV transmission line after completion of the 1989 field studies and public consultation. It also presents the key findings of B.C. Hydro's consultants from the public consultation and environmental studies. The report provides a comparative analysis of all alternative routes and identifies what appears to be a generally acceptable route, at this time. The report is intended to meet the preliminary planning stage of the information requirements of the Energy Project Review process of the B.C. Ministry of Energy, Mines, and Petroleum Resources.

This report is being circulated to all levels of government, to Indian Bands, and to all parties expressing interest in the project, as a sequel to the Prospectus for the project issued in September 1989. B.C. Hydro is planning to meet with the Indian Bands and to undertake further public consultation after release of this report. The nature of the next round of the consultation program will reflect the comments received on this report.

1.2 Project Description and Purpose

It is B.C Hydro's proposal to construct a second 500 kV single circuit transmission line between Kelly Lake Substation, near Clinton, and Cheekye Substation, near Squamish, a distance of approximately 200 km, dependent on route selection. The line would be known as circuit 5L46.

The route to be used by the project has not been determined. The network shown in Figure A, within which is expected to be found the final route, has been reviewed in the current set of studies. An influence on route selection is that B.C. Hydro proposal to remove transmission line 2L1 from Shalalth to Cheekye as part of this project. Its ROW would then be available for use by this project, where appropriate.

Transmission planning studies have shown this project to be the most effective way to increase the transmission capacity of the electrical transmission system from the Interior to the Lower Mainland while maintaining acceptable levels of reliability. The rationale for studying the project comes from the forecast increase in demand for electricity in the Lower Mainland and on Vancouver Island for the next ten to twenty years. Based on present expectations of growth, transmission reinforcement is expected to be required in the mid-1990s. Figure D shows B.C. Hydro's existing 500kV transmission system.

Because of the forecast increase in demand, it is B.C. Hydro's intention to submit an application for an Energy Project Certificate for this project in 1990 so that it will be possible to meet a 1995 in-service date if required. If demand is less than expected, the scheduled 1995 in-service date could be postponed.

SECTION 2.0 RECENT STUDIES & PROGRAMS UNDERTAKEN BY B.C. HYDRO

2.1 Technical

Since this project was reactivated in 1989, B.C. Hydro has reviewed the technical feasibility of all the routes in the network shown in Figure A. All sections of potential routes identified as being of public concern in earlier studies have received further study.

Helicopter reconnaissance confirmed the technical feasibility of use of any part of the route network shown in Figure A. Colour and black and white aerial photography of the network was completed in August 1989 at scales of 1:10,000 and 1:25,000 respectively to assist field studies and future surveys. A winter inspection has been made of the mountain passes west of Whistler.

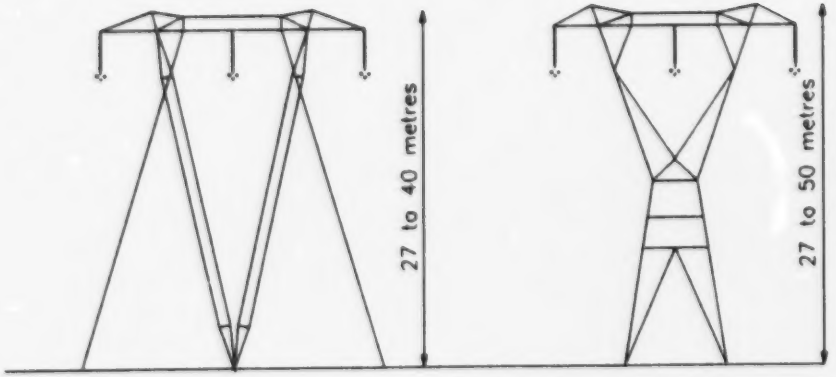
Self supporting and guyed steel towers would be used, either using B.C. Hydro's present flat configuration or a new delta configuration, both are shown in Figure B. Comparison of the flat and delta configurations for the conductors continues, and no firm decision has been reached. The delta configuration offers some electrical benefits, and a reduction of clearing width of 10 metres, but at some extra cost and a nine metre increase in height. It is physically possible to switch from delta to flat configuration between towers to reduce height and visibility, but the electrical consequences of this have not yet been determined.

The standard ROW width adopted by B.C. Hydro for a new 500 kV line is 64 metres (210 feet). However for this project an existing 61 metre (200 feet) ROW exists for much of the length. B.C. Hydro therefore proposes to use a 64 metre ROW where new ROW is required but to adapt to the 61 metre wide ROW where it is to be used. The proposed ROW and clearing widths for each conductor configuration are shown in Figure C.

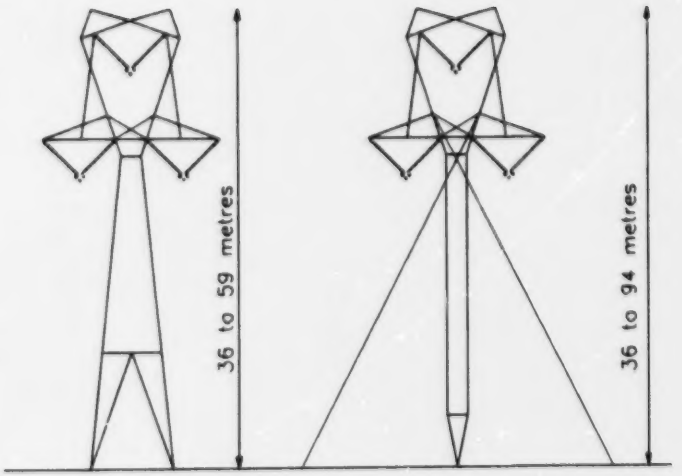
B.C. Hydro recognizes that transmission line routing in the Birkenhead River Valley has resulted in congestion and high visual impact. It is continuing to review possible improvements in this segment.

KELLY LAKE - CHEEKYE

500 kV TRANSMISSION LINE PROJECT
STRUCTURE TYPES



OUTLINE OF EXISTING 500 kV STRUCTURE TYPES



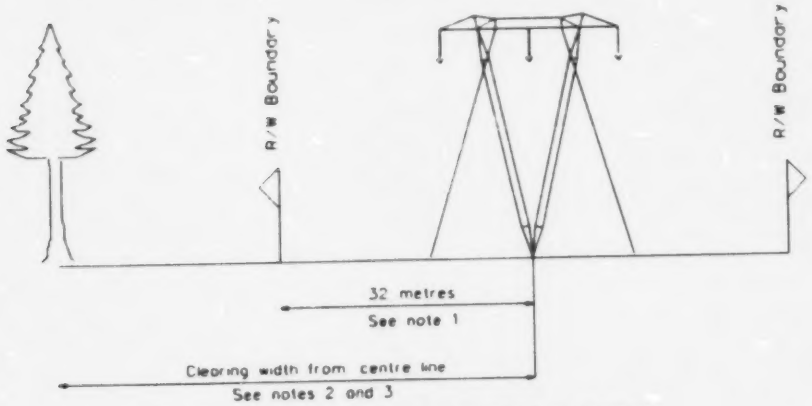
OUTLINE OF ALTERNATIVE STRUCTURE TYPES

FIGURE B

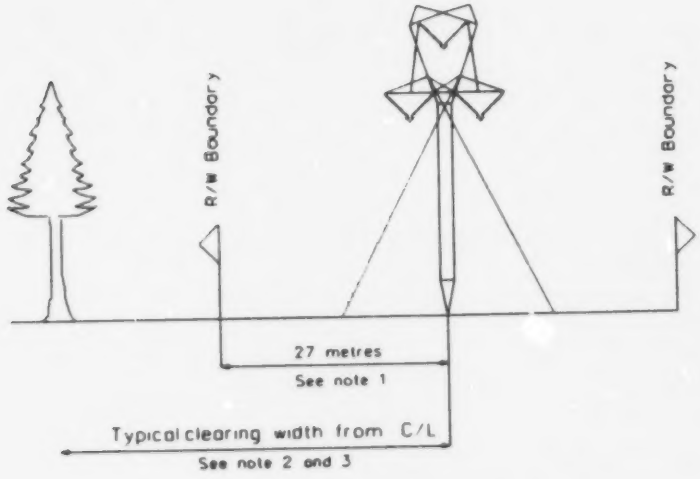
FIGURE C

KELLY LAKE - CHEEKYE
500 kV TRANSMISSION LINE PROJECT
TYPICAL R/W AND CLEARING WIDTHS

FLAT CONDUCTOR CONFIGURATION



DELTA CONDUCTOR CONFIGURATION



NOTES

1) Where existing 2L1 R/W is utilized, R/W edge distance is 30.5 m.
2) Clearing widths are a function of several factors including; tree height, ground slope, tree species, site growing conditions, conductor height above ground, and free health
3) Typical anticipated clearing widths from centreline are as follows:

i) 50 metres for FLAT CONFIGURATION with... -30 metre tree height, -level ground -11 metre conductor height.

ii) 45 metres for DELTA CONFIGURATION with.. -30 metre tree height, -level ground. -11 metre conductor height

iii) 26 metres for FLAT CONFIGURATION with... -15 metre tree height -30 per cent ground slope -11 metre conductor height

iv) 21 metres for DELTA CONFIGURATION with... -15 metre tree height -30 percent ground slope -11 metre conductor height

At Pemberton one land-owner has requested a review of routing adjacent to 5L42 and the various options are being studied.

In the Lower Cheakamus River Valley a group of residents has petitioned B.C. Hydro to locate 5L46 off the 2L1 ROW. Alternative routes are reviewed in this report. Further studies are also ongoing at Whistler in an effort to identify an agreed on route.

2.2 Environmental

The current environmental studies, including both biophysical and social components, are the third in a series on this project with earlier studies being completed in 1981 and 1984. The 1981 studies were undertaken by Sigma Resource Consultants and done in conformity with the 'Guidelines for Linear Development'. They concluded that it was preferable to use the existing transmission corridor. The documented response of the Provincial Government has not yet been located, but it is believed to be acceptance of the conclusion.

The second set of studies was completed by Cypress Resource Consultants in 1984. This set was designed to identify an alignment within the corridor determined in the 1981 studies, and to conform to the information requirements of the Energy Project Review Process. As the project was deferred by B.C. Hydro in 1984 the Cypress report was not issued at that time. It has since been released as a reference report and the conclusions reached in it on an alignment have been used as the starting point for identification of an alignment in the existing corridor.

The intent of the current biophysical studies is to update existing information and to provide data on sections of the network not included in the earlier studies. These studies include reviews of terrain, vegetation, wildlife, forestry, agriculture, fish, recreation, aesthetics and heritage resources.

The social impacts of the project are being assessed by the consultant who is also reviewing land use along the route network, with the intent of identifying present and possible future conflicts. This consultant has met with all agencies responsible for land use planning within the route network area, including provincial, regional and municipal governments. In addition, there have been informal meetings of project leaders with the Bridge River, Seton Lake, Anderson Lake, and Mount Currie Indian Bands to review their concerns about possible effects on their lands. The social component will not be complete until there have been formal meetings with all Band Councils to review the project. Negotiations continue to achieve this objective.

All environmental consultants are also seeking to determine specific situations which may require mitigation and to examine ways to achieve this. The environmental studies have been fully integrated with an active public consultation program.

2.3 Public Consultation

The public consultation program for the Kelly Lake - Cheekye Project began in April 1989 in conjunction with environmental and technical studies. The main objectives of the program are: to foster broad based understanding of the need for the transmission line and the planning process; to provide opportunities for ongoing information exchange between project area residents and B.C. Hydro; and to stimulate public discussion of alternative routes. The area of public consultation stretches from Clinton to Squamish, it includes these two communities as well as Lillooet, Seton/Shalalth, D'Arcy, Birken, Pemberton, Mt. Currie, and Whistler. Phase 1 consultation activities involved the development of a detailed public consultation plan. This plan outlined a number of major task areas which were implemented by the Project Team as follows:

- project planning and project announcement;
- initial meetings with municipal/regional governments and B.C. Hydro District Office personnel;
- one to one consultation;
- preparation of information materials;
- consultation with special interest groups and community organizations;
- contact with native bands;
- regional open houses;
- ongoing consultation as required.

Initial Meeting:

A series of initial meetings were held in the study area, with the Squamish Lillooet Regional District, the Municipal Councils of Clinton, Lillooet, Pemberton, Whistler and Squamish. Meetings were also held with the local B.C. Hydro Customer Services and Production employees.

The Municipal representatives were very helpful and informative in highlighting possible areas of concern, types of impacts that could be priorities with local residents and suggestions for mitigation/compensation strategies.

One to One Consultation:

One to one consultation was undertaken with a number of key local residents with respect to recent planning and development issues in the area and, more specifically, about the proposed transmission project.

Personal and telephone interviews were conducted with 70 local people who are actively involved in local issues.

Public Information Materials:

In preparation for the first public meetings, various types of public information materials were prepared as follows:

- Press Releases: two press releases were issued by B.C. Hydro in June 1989 to the local area as well as Lower Mainland newspapers.

- Information Centres: within the study area, libraries and government offices housed project-related information (reports, maps etc.) for the public to review.

- Project Newsletter: a four page newsletter outlining project history, the public consultation process, technical/environmental studies underway, routes being considered, a toll free telephone number and a mail-in coupon was distributed to every household in the region prior to the project Open Houses.

- Other Information: at the project Open Houses visual and informational materials were available to the public including display boards, Project Prospectus, brochures on vegetation management and Power Smart programs etc.

Special Meetings:

B.C. Hydro's Project Team met with individuals and groups in the study area who had a special interest in the proposed project. Area residents were given opportunities to ask questions, voice concerns and receive feedback from B.C. Hydro.

Examples of individuals/groups who met with the Project Team include:

- Interest Groups including members of the Whistler business community and a parents group in Pemberton
- Yalakom Valley/Antoine Creek Valley Residents (November, 1989)

Contact with Native Bands:

There are eight Bands who could potentially be affected by this proposed transmission line depending on the route that is chosen. They are the Mount Currie, Pavilion, Squamish, Lillooet, Anderson Lake, Seton Lake, Whispering Pines and Bridge River Bands.

Generally, the interest expressed by these Bands in participating in the public consultation process has been minimal. Most Bands have been personally contacted by representatives from B.C. Hydro. Initial meetings were held with Mount Currie, Pavilion Band, Bridge River, and Anderson Lake Indian Bands. The Seton Lake Band hosted an Open House which is noted below. Whispering Pines Band has yet to be contacted, but has been sent full project information.

At the time of preparation of this report the Indian Bands, including those of the Lillooet and Squamish Tribal Councils, had not yet agreed to discuss the project, and have limited their involvement to gathering of information. No band has refused to discuss the project, but starting such discussion has been complicated by the need to negotiate issues related to existing transmission lines across some reserves in the project area.

As a result all route options shown near reserves are tentative. No attempt has yet been made by B.C. Hydro to negotiate for new ROW with any Band. B.C. Hydro continues to seek to brief the Indian Bands that might be affected by the project and to negotiate with any Band where ROW may be required. Steps are now being taken to assess options around reserve land.

Open Houses:

A total of eight Open Houses were held in the first two weeks of October, 1989 in the communities of Clinton, Shalalth, Lillooet, Pemberton, Birken, Whistler, Squamish and the Seton Lake Band.

Interest in the project seemed to be most pronounced in Lillooet, Pemberton, Birken and Squamish. Generally, the attendance was, on the average, lower than anticipated with a total of 297 persons for all eight Open Houses.

The types of concerns and questions raised at the Open Houses were similar to those that emerged during initial meetings and the interviews for the community profile.

Consultation will continue in 1990 in response to the comments received following issue of this report.

SECTION 3.0 ENVIRONMENTAL FEATURES OF NETWORK SEGMENTS

The important features of each segment of the route network and the key environmental issues within each, are as follows, using the segment names and node letters shown in Figure A.

3.1 Kelly Lake (AB) (6 kilometres)

The segment starts at the substation and rises over forested slopes to the Pavilion plateau. The route uses an existing uncleared ROW to the east of existing transmission lines 5L41, 5L42, 2L90, and 2L91. The key issues are:

-Increased visual impact of widening cleared width from 120 metres to 180 metres.
-Loss of 36 hectares productive forest land.

3.2 Antoine (BG) (44 kilometres)

The segment leaves the existing transmission lines on Pavilion Mountain heading west to cross the Fraser Canyon. It continues west to cross the Camelsfoot Range near Slok Hill, where it turns south to descend to the Bridge River crossing through the Antoine Creek Valley. From the Bridge River it continues south, rising to join the 5L42 ROW on Mission Ridge.

The key issues are:

- Adverse impact on heritage sites at Arden Park in Kelly Creek Valley, and at Kelly Creek IR 3 where there are important old Indian village sites.

- Development of road access into California bighorn sheep winter range in Cavanagh Creek Valley and Fraser Canyon.

- High terrain impacts in Cavanagh Creek Valley.

- New isolated crossing of Fraser Canyon with implications for aircraft safety, and high visual impact for river users.

- Loss of productive forest land on Camelsfoot Range.

- High terrain disturbance and visual impact resulting from construction on steep ridges in Antoine Creek Valley, where revegetation will be very difficult.

- Intrusion into natural landscape of Antoine Creek Valley which is the home of a group of people determined to maintain a way of life close to nature, and which is likely to remain a natural landscape due to limited forest and difficult terrain.

- Disturbance during construction and operation of line on mountain goat, bighorn sheep, and deer populations of Antoine Creek Valley.

- Visual impacts at crossing of Bridge River near attractive Camelsfoot Bend.

- Loss of productive forest land on north side of Mission Ridge.

3.3 Pavilion (BCEF) (29 kilometres)

This segment runs south from B over the Pavilion Mountain rangelands using an existing unused ROW on the east side of transmission lines 5L41, 5L42, 2L90, and 2L91. At C within the Pavilion Indian Reserve it turns west, requiring new ROW to cross 5L41, 2L90, and 2L91 and to continue adjacent to the south side of 5L41 across the Fraser Canyon. It then turns south and lies adjacent to the east side of 5L41 in a long rising traverse of the east side of the Camelsfoot Range before descending to F in the Bridge River Indian Reserve.

The key issues are:

- Incremental visual impact on the scenic rangelands on Pavilion Mountain.

- Incremental impacts on grazing lands of Diamond S Ranch and use of Pavilion Indian Reserve.

- The crossing of the Fraser River is adjacent to the existing crossing, resulting in a single crossing with less risk to aircraft, and only incremental visual impact.

- Incremental visual impact in view of Camelsfoot Range from highway between Lillooet and Pavilion.

Sub-option CDE starts at C in which the segment would continue south of C on existing

ROW through the Pavilion Indian Reserve turning west at D to cross the Fraser Canyon and rejoin 5L41 at E.

The key issues associated with sub option CDE are:

- Avoidance of the need for new ROW on Pavilion Indian Reserve.
- Higher visual impact at crossing of Fraser Canyon and increased hazard to light aircraft as a result of separation of crossings.
- Interference with wheeled irrigation system for Diamond S hayfields south of Pavilion.
- Visual impacts of two crossings of highway within 1.5 kilometres with no screening of line by trees.

3.4 Mission (FG) (15 kilometres)

The segment rises from the Bridge River at F to the top of Mission Ridge at G and lies adjacent throughout to the south side of 5L42.

The key issues are:

- Loss of productive forest land.
- Difficulty in revegetation over 2.5 kilometres in alpine areas, resulting in possible erosion.
- This is an area where heavy icing of conductors and towers can occur, but standard construction is considered adequate for new line in light of experience with 5L42, for which extra heavy special construction was used to cross Mission Ridge.

3.5 Anderson (GH) (37 kilometres)

As part of this project B.C. Hydro proposes to remove transmission line 2L1 in its entirety from Shalalth to Cheekye with its ROW then being available for 5L46. Thus in this segment the 2L1 ROW is available for the new project, south of Seton Portage.

For 15 kilometres the segment descends from G, adjacent to the south side of 5L42, in a long sidehill traverse above Shalalth and Seton Portage, then crosses 3L2 and 2L2 to the west of Seton Portage to reach the existing 2L1 ROW. This ROW is used for 18 kilometres along Anderson Lake to D'Arcy. Here the segment diverges for 4 kilometres from the 2L1 ROW to lie higher up the slope adjacent to 2L2 until it meets the south side of 5L42 where the latter crosses over 3L2 and 2L2 at H.

The key issues are:

- Difficult conditions for revegetation for 5 kilometres in alpine areas on Mission Ridge and on dry slopes above Seton Portage.
- Desirability of avoiding the small area of developable land at Seton Portage.
- Protection of water quality in many domestic supplies between Seton Portage and D'Arcy.
- Reduction of visual impacts of transmission lines at Seton Portage and D'Arcy.
- Future status and management of B.C. Hydro's Highline Road from Seton Portage to D'Arcy.

3.6 Gates (HJ) (28 kilometres)

This segment goes westward in the narrow Gates River Valley for 14 kilometres from H, then turns south in the Birkenhead River Valley for 14 kilometres to J. In the Gates River Valley the route would leave the 2L1 ROW about 2 kilometres from H, rise high on the south side of the valley and then descend in a long traverse for 12 kilometres to return to the 2L1 ROW west of Gates Lake. For a 3 kilometre portion of this section it would lie adjacent to the south side of 5L42.

In 1983 there was much interest in this section of the line due to the proximity of many homes to the existing transmission lines. The intent of this diversion is to reduce the visual and land use impacts of the new line relative to the impacts of use of the existing 2L1 ROW.

The use of the 2L1 ROW is presently proposed in the Birkenhead River Valley, although it is recognized by B.C. Hydro that this is a section warranting further detailed study to reduce visual impacts, if this route is finally selected.

The key issues are:

- Reduction of land use constraints on narrow valley bottoms where settlement occurs.

- Protection of water quality in Gates River and its spawning channel, and Birkenhead River where there are high fish values.

- Reduction of visual impacts in settled areas and at Gates Lake.

- Continued impact on potential use of small Lokla Indian Reserve of Mount Currie Indian Band, which is also traversed by 2L2, highway, and railway.

3.7 Duffey (FJ) (89 kilometres)

From F in the Bridge River Indian Reserve the segment runs southeast for 1 kilometre to meet 2L90 and 2L91. It then follows these south for 6 kilometres adjacent to their west side through the Lillooet Indian Reserve to Town Creek, here it diverges from 2L90 and 2L91 to the west for 2 kilometres to rise over a prominent rock ridge on the north side of the Seton River Valley.

It then crosses the Seton River Valley and enters the canyon of Cayoosh Creek which it follows for 13 kilometres. This is a very difficult section due to the terrain. From the upstream end of the canyon the segment continues south and west for 45 kilometres to Cayoosh Pass using the south and east sides of the Cayoosh River Valley and passing Duffey Lake on the way.

At Cayoosh Pass the segment turns south descending the west side of Joffre Creek Valley for 9 kilometres before turning west above the head of Lillooet Lake. It continues westwards on sidehill for 3 kilometres to a junction with 3L2 which it then follows, adjacent to its north side, for 10 kilometres to meet the 2L1 ROW near Creekside. In this last section 7 kilometres would be within Mount Currie Indian Reserves 6 and 7.

The key issues which have been identified are:

- The Squamish Lillooet Regional District objects to this route as impairing a highly scenic section of the new tourist highway route from Vancouver to Lillooet.

• The Village of Lillooet considers the proposal would have an adverse effect on the village as there is no vegetation west of the village to screen the lines, and because its visual impact might affect tourist appeal of the Duffey Lake highway which is run as an important asset to the village.

• The line would interfere with irrigation on hayfields north of Lillooet.

• The Mount Currie Indian Band do not want another transmission line through their major reserve, and adjacent to their newly developed village.

• The loss of forest production in Cayoosh River Valley, upstream of the canyon, and in Joffre Creek Valley, would be high because of the high average site quality.

• The terrain hazard in the Cayoosh River Valley, in terms of avalanches and rock slides, is high.

• Adverse impact on existing Joffre Lakes recreation area and proposed provincial park at Duffey Lake.

• High visual impacts in Cayoosh Canyon.

• Important mountain goat and grizzly bear habitat would be affected in the Cayoosh River Valley, and construction and operation of the line would disturb wildlife.

3.8 Pemberton (JK) (10 kilometres)

For 4 kilometres south of J to the north side of the Lillooet River Valley the segment uses the 2L1 ROW, which lies between 2L2 and 5L42. Here it leaves the 2L1 ROW and crosses the valley adjacent to the northwest side of 5L42 following it over Signal Hill for a total of 5 kilometres. Near K it crosses 5L42 and uses a new ROW for 1 kilometre on the east side of the Green River Valley.

The key issues are:

• There is a desire to move transmission lines out of the village of Pemberton to allow better planning of the limited developable land above the flood plain. A route adjacent to 5L42 with release of 2L1 ROW within the village achieves this.

- Interference with farming operations near Pemberton.

- Concern over impact on views from Lillooet River Valley.

- Proposed route reduces visual clutter of transmission lines on approach to Pemberton from south, including at One Mile Park, by removal of 2L1 for 4 kilometres.

3.9 Birkenhead (HI) (20 kilometres)

This segment runs west from H for 12 kilometres on the south side of the Blackwater River Valley. It then runs southwest and traverses Birkenhead Provincial Park for 8 kilometres on the forested slopes above the southeast side of Birkenhead Lake.

The key issues are:

- Ministry of Parks and many local residents are very concerned at high visual impact of traverse of Birkenhead Lake Park through mature forest on mountain side, well above lake, and at disturbance of wildlife within park from construction and operation of line. Reduction in park values.

- Loss of 72 hectares of productive forest land outside park.

3.10 Owl (IK) (25 kilometres)

This segment crosses the Birkenhead River Valley, rises steeply onto the sub-alpine and alpine ridges in the Fowl and Owl Creek drainages, then descends steeply into the Lillooet River Valley due north of Pemberton. It then crosses the farmland in an area with considerable settlement and skirts the western and southern sides of the village of Pemberton.

The key issues are:

- Visual impacts for small community at south end of Birkenhead Lake.

- Impacts of construction and operation of line in proposed provincial park in sub-alpine and alpine areas of Owl and Fowl drainages, including visual impact, wildlife disturbance, and loss of wilderness character.

- High visual impacts of ROW on descent into Lillooet River Valley, and of hillside traverse above Pemberton.

- Impacts on settlement and farming operations of crossing of farmlands near Pemberton.

- Water quality concerns from crossing of watershed area for Pemberton, due to clearing and maintenance of ROW.

- High visual impact of another ROW across main activity area of Nairn Falls Provincial Park.

- Use of this segment with Birkenhead segment would remove 2L1 from 39 kilometres of existing corridor.

3.11 Green (KL) (2 kilometres)

This short segment is on the eastern forested side of the Green River Valley.

The key issues are:

- Removal of 2L1 for 2 kilometres along highway and at entrance to Nairn Falls Park.

- Loss of 12 hectares of productive forest land.

3.12 Soo (LM) (18 kilometres)

The first 4 kilometres of this segment is an angled crossing of the Green River Valley. The segment continues southwest for 6 kilometres on a descending sidehill traverse into the Soo River Valley. Near the crossing of the Soo River the segment turns west and follows the logging road along the south side of the wetlands for 6 kilometres. It then rises for 2 kilometres to M on the ridge overlooking the pass west of Rainbow Mountain.

The key issues are:

- Visual impact from Highway 99 of crossing of Green River Valley, especially on west side.

- Loss of 108 hectares of productive forest land.

- Visual impact in Soo River Valley which will probably become an important recreation access corridor for both winter and summer recreation based in Whistler.

- Disturbance to wildlife from construction and operation of transmission line close to wetlands. The latter are an unusual and important feature in Coast Mountains.

- Use of this segment with Rainbow segment would result in removal of 2L1 for 37 kilometres between L and N through Whistler.

3.13 Ryan (IM) (57 kilometres)

This segment crosses the Birkenhead River Valley at the south end of Birkenhead Lake and rises westwards up the valley of Tenas Creek to Ogre Lake (10 kilometres), crosses the alpine ridges at the head of Owl Creek (3 kilometres), descends steeply into the Lillooet River Valley (3 kilometres), crosses the farmlands (2 kilometres), rises steeply on a ridge at the mouth of Ryan Creek (1 kilometre), and ascends the valley of Ryan Creek and a southerly tributary to climb to the alpine ridge at the divide (18 kilometres).

From there it continues southward descending the valley of Rutherford Creek (11 kilometres) before rising steeply to cross the ridge between Rutherford Creek and the Soo River (3 kilometres). From the crest of this ridge it angles southwest across the wide Soo River valley to M on the ridge at the entrance to the pass west of Rainbow Mountain (6 kilometres).

The key issues are:

- Visual impact near settlement at south end of Birkenhead Lake.

- Intrusion into scenic wilderness area at head of Tenas and Owl Creeks proposed by Ministry of Parks for a provincial park, and disturbance of mountain goat and other wildlife in this area.

- Interference with farming operations on arable ground in Lillooet River Valley.

- High visual impacts on descent into, and ascent from, Lillooet River Valley.

• Loss of 240 hectares productive forest land in valleys of Tenas, Ryan, and Rutherford Creeks, and Lillooet and Soo Rivers.

• High level of risk from avalanches and rock slides in headwater area of Ryan Creek.

• Effects on local grizzly bear and mountain goat populations of construction and operation of line in the upper valleys of Ryan and Rutherford Creeks, and Soo River Valley.

• Visual impact on attractive alpine ridge north of Soo River and in Soo River Valley which will become an important recreation access corridor for Whistler, and in Heliski areas.

• Use of this segment with Rainbow and Birkenhead segments would result in removal of 2L1 for 98 kilometres from existing corridor.

3.14 Rainbow (MN) (23 kilometres)

This segment runs south from M, descending from the ridge to the valley floor at the pass west of Rainbow Mountain (4 kilometres). From the pass it continues south through the forest lands of the Lower Callaghan River Valley to skirt the west side of Brandywine Provincial Park and return to the 2L1 ROW at N just south of the park (19 kilometres).

The key issues are:

• Crossing of Rainbow/Callaghan Lake alpine area, often viewed as providing future opportunity for expansion of winter and summer recreation at Whistler.

• Loss of 110 hectares of productive forest land in Callaghan River Valley and visual impact in this valley which is seen as an important recreation access corridor in the future.

• Ministry of Crown Lands is concerned about visual impact for heliski visitors, and safety to helicopters using Rainbow Pass.

• Use of this segment with Soo segment would allow removal of 2L1 for 37 kilometres through Whistler, including north and south approaches, and from Brandywine Provincial Park.

• Rainbow Pass is subject to avalanches and rock slides but a safe route is feasible.

3.15 Whistler (LN) (37 kilometres)

This segment descends from L along the east side of the Green River Valley (3 kilometres) to meet 5L42. It continues south adjacent to the east side of 5L42 for 4 kilometres, then crosses it to regain the 2L1 ROW which it follows through Whistler, apart from a short diversion at a kink south of Green Lake, to a point on the bench above the west side of Alta Lake (17 kilometres). It then leaves the 2L1 ROW heading southwest to join 5L42 (3 kilometres) and follows 5L42 for 2 kilometres lying adjacent to its north side to a crossing point about 1.5 kilometres west of the sewage plant. Here it turns southward, and rises over a forested ridge before descending again to cross the eastern fringes of Brandywine Park, 5L42, and the head of Daisy Lake to return to the 2L1 ROW (8 kilometres).

The key issues are:

• Desire to reduce visual impact of transmission lines adjacent to developed areas, and throughout Whistler and its approaches, particularly from the south. Use of this segment removes 2L1 for 8 kilometres along the highway south of Whistler and for 8 kilometres north of Whistler.

• Concern for protection of wetlands between Alta and Green Lakes. Use of this segment would result in disturbance of the wetlands during construction but would require no further clearing.

• Desire to reduce interference with recreation potential on valley floor between Whistler and Daisy Lake. Use of this segment would remove 2L1 from entrance and high use area of Brandywine Park.

• Use of this segment would avoid changes to wilderness and recreation lands on the west side of Whistler until management plans are developed for the area.

3.16 Upper Cheakamus (NP) (13 kilometres)

This segment runs south from N using the 2L1 ROW (9 kilometres) to a point near the head of the Cheakamus Canyon. Here it leaves the ROW, and ascends to a high bench on the west side of the canyon, which it follows south to P.

The key issues are:

- Reduction in visual impact at head of canyon by removal of 2L1 at the cost of some impairment of more distant views as a result of location on west side of canyon.

- Use of 2L1 ROW past Pinecrest and Blacktusk Village will minimize impacts of construction and operation on these sub-divisions.

3.17 Lower Cheakamus (PT) (15 kilometres)

This segment descends from P to the floor of the Cheakamus River Valley at Q (2 kilometres) where it meets the 2L1 ROW and uses this through R to T (13 kilometres). There are three sub-options considered in the segment as a result of local concerns on project routing. The west sub-option PR (10 kilometres) traverses the forested sidehill on the west side of the valley to reduce use of the valley floor. The south sub-option RST (7 kilometres) rises onto the rocky ridges on the east side of the valley to avoid the North Vancouver Outdoor School and the Cheakamus Indian Reserve. The east sub-option QS (8 metres) rises onto rocky ridges on the east side of the valley to reduce use of the valley floor.

The key issues are:

PQRT

- Local residents have requested B.C. Hydro not to use existing ROW because of alleged effects of existing transmission line.

- Legal status of B.C. Hydro's access road in this section on which local residents depend.

- Existing 2L1 ROW is very close to buildings of North Vancouver Outdoor School. Further clearing may be necessary for 500 kV line, depending on conductor formation to be used, this would reduce screening of school from road and remove some prized old trees.

- B.C. Hydro does not have a legal ROW across Cheakamus Indian Reserve.

PR

• High visibility from Highway 99, detracting seriously from magnificent view of Tantalus Range from highway.

• Clearing of 10 kilometres of new ROW on steep hillside in high rainfall area would result in erosion and siltation of Cheakamus River, highly valued for its fishery.

RST

• Use of this sub-option avoids the North Vancouver Outdoor School and the Cheakamus Indian Reserve.

• The ascent from R to the rocky bench above the valley will be visible to southbound travellers in the Cheakamus Valley. As very little clearing is anticipated because of the rock bluffs the impact should be low.

• The line can be located on the higher ground near S so that it is not seen from Highway 99, Brohm Lake, or Cheakamus River Valley.

• A site of an event in a myth of the Squamish Indians is reported at the bluffs north of S.

QS

• About 3 kilometres of this sub-option is close to Highway 99 and highly visible. It would severely impact views west from the highway to the Tantalus Range.

SECTION 4.0 RESULTS OF PUBLIC CONSULTATION PROGRAM TO DATE

This section highlights the public concerns and issues associated with the proposed Kelly Lake - Cheekye project that have been identified to date. These concerns and issues were identified by the public in the forums highlighted in Section 2.3 of this report (initial meetings/one to one consultation/open houses/contact with native bands).

It must be emphasized that, to date, contact with Indian Bands and Tribal Councils in the study area has been limited to the extent that Councils and Bands wished to participate; hence, their concerns have only been partially identified in this report.

The Lillooet Tribal Council, on behalf of its member Bands, has recently written to B.C. Hydro and stated that it has chosen not to participate in the corporation's public consultation program for the proposed project and does not require information regarding the program. The Tribal Council proposed establishment of a formal structure for negotiations. They want to see some evidence that B.C. Hydro is dealing with outstanding grievances (mainly over rights to property and access).

Many of the issues raised as part of the environmental assessment presented in Section 3.0 of this report were identified as concerns by the public in the study area.

The public concerns described below are organized into two categories: general and route related. The order of the concerns does not reflect their relative importance. A breakdown of the concerns expressed by the individual communities in the study area follows the General Concerns/Issues section.

Community Specific Issues/Comments:

Highlights of the project related issues/comments raised at meetings with the various communities, as well as in correspondence, are documented in general terms below.

Clinton:

- creation of local economic benefits (clearing and construction jobs);
- potential risks of electric and magnetic field;
- use of pesticides on ROW;
- few direct local benefits from the project (lost timber values);
- need/justification for this transmission line;
- visual impacts of the proposed transmission line;

- energy efficiency of existing facilities;
- no route preference stated by Municipal Council.

Lillooet:

- protection of the scenic qualities of the Duffey Lake Road for tourism;
- protection of wilderness areas should be balanced by potential costs on settled areas;
- potential risks to human and animal health from electric and magnetic fields;
- anticipate economic benefits from the proposed project;
- suggest that B.C. Hydro should curb increasing demands for power by developing more conservation programs and increasing rates;
- support the concept of ROW vegetation management;
- visual impacts of transmission lines;
- assurances that B.C. Hydro would clean up felled timber in the ROW;
- foregone agricultural potential of land crossed by transmission lines;
- investigations into alternate energy sources;
- more visible role for B.C. Hydro by organizing and participating in community affairs;
- Municipal Council prefer that the existing ROW be used and Duffey Lake be avoided.

Yalakom Valley/Antoine Creek Valley Residents:

- representatives of a communtiy situated in the Yalakom Valley/Antoine Creek Valley, attended the Lillooet Open House to express their opposition to the possibility of the transmission line construction along the Antoine route segment;
- subsequent to the Open House, a meeting was held with area residents in which they re-iterated this position.

Seton/Shalalth:

- desire to see B.C. Hydro contribute to the upgrading and maintenance of the Hiline Road which links Seton/Shalalth to Pemberton;
- B.C. Hydro should consider compensation to small rural communities that bear the costs of transmission line development;
- possibility of using the ROW for agriculture and/or horticulture;
- anticipate that proposed project would bring new residents to the community;
- residents are generally supportive of the use of the existing ROW.

Seton Indian Band:

- desire to discuss specific resource issues and impacts with B.C. Hydro's environmental consultants;
- new ROW will further expose traditional land uses to intrusion by non-natives;
- need for a long term plan to deal with general development pressure in the region;
- support for the improvement and year round maintenance of the Hiline Road;
- support for the removal of 2L1 near their lands;
- Band did not state a preferred routing option.

Pemberton:

- potential drop in property values and disruption of land and activities along the proposed ROW;
- visual impacts of transmission lines;
- potential risks to farm animals and human health from EMFs and herbicides;
- desire to remove transmission lines near the local elementary school;
- agricultural potential foregone by transmission line development;
- concern that B.C. Hydro has already selected a preferred route;
- queries about justification for the proposed project;
- concern over the safety and monitoring of PCB storage at Creekside;
- Mount Currie Band registered concern that traditional activities would be detrimentally affected by another transmission line;
- B.C. Hydro to clarify the issues of power export and specifically whether this proposed project would transmit power for export;
- potential negative impacts for tourism activities;
- route preference not stated by Municipal Council.

Birken:

- some opposition to the predominant view that the Duffey Route is not an acceptable option;
- negative impacts on property values and on visual resources;
- fair compensation for timber values that could be lost through new ROW clearing;
- opposition to energy development for export;
- feeling that B.C. Hydro has not responded adequately to local concern about safe storage of PCBs;
- potential health effects of EMFs;

• residents appear to prefer the alternative which involves a possible replacement of an existing line with minor variations on route location for certain property owners; avoid Birkenhead Park.

Whistler:

• visual impacts of another transmission line;
• issues of project justification, power export and B.C. Hydro's commitment to conservation programs;
• no direct benefits for local areas;
• implications of the Meager Creek development or other independent power developments for the Kelly Lake - Cheekye Line;
• potential health effects from EMFs;
• residents who attended the Open House favoured the new line to follow the existing route;
• Whistler Council has not stated a preferred route.

Squamish:

• potential effects of herbicides (used for ROW clearing and maintenance) on domestic water supplies;
• impact on private property values adjacent to the ROW and loss of land;
• require justification for the project;
• perceived inequitable distribution of costs and benefits associated with energy project development;
• potential for local economic benefits;
• concern expressed regarding the visual impacts of transmission lines;
• role of independent power producers;
• concern about the potential health effects of EMFs;
• the North Vancouver Outdoor Recreational School expressed opposition to use of the existing transmission line due to impacts on the facilities and programs;
• no increase in size of Cheekye Substation is perceived as positive;
• most residents in the Cheakamus Valley appeared to favour the alternative route which would replace an existing 230 kV transmission line, with the condition that the new line deviate in places from the existing ROW in the Lower Cheakamus Valley;
• at the Squamish Open House, Upper Cheakamus Valley residents presented B.C. Hydro with a petition signed by about 30 residents of the Valley stating their opposition to the proposed route using the existing ROW.

Squamish - Lillooet Regional District:

- Squamish-Lillooet Regional District includes all of the study area communities except Clinton;
- preferred routing is the existing corridor, if the project is built, rather than crossing the relatively undisturbed landscapes such as Duffey Lake, the Soo Valley and Callaghan Creek.

General Concerns/Issues

Project Justification and Power Export

A major issue throughout the study area is the justification for the Kelly Lake-Cheekye line, as opposed to alternative lines in other areas, or no new lines. There has also been considerable discussion about power export; some of the public generally supports the merits of exporting power from existing plants at times of water surplus, but opposes the export of firm power. Questions were raised as to whether this project would actually be built to supplement export of firm power and why such export is even considered as an option if domestic demand is increasing. Opposition to the concept of firm power exports was recorded consistently in the public consultation program, mainly on the grounds that small rural communities are becoming increasingly unwilling to bear the costs of power generation and transmission for the benefit of people in another country. Closely associated with project justification and export, is the question of the degree of commitment that B.C. Hydro has made to conservation (programs like Power Smart). Many people in the study area expressed the opinion that far greater efforts should be made, and that B.C. Hydro should change its rate structure to further encourage conservation of energy.

Electric and Magnetic Field (EMF) Effects

A second predominant concern is the perceived potential for risk to human (and to a lesser extent farm animal) health from EMF effects. Concern is heightened by the perception that risk is increased from cumulative effects (there are three to four lines running through several parts of the study area) and from upgrading to a higher voltage line. Generally, people want to know more about this topic and some would prefer to receive information from a source more "neutral" than B.C. Hydro. There are specific concerns about EMF effects near private homes and schools (in Pemberton and near Squamish).

Visual Impacts

Several residents feel that the proposed project would have an adverse effect on the aesthetic values of the area and hence tourism activities, especially around Whistler and Pemberton. (The preference stated by many of the public for the Anderson Lake rather than Duffey Lake route is based in part on maintaining the scenic qualities of the latter for tourism). Although there is a desire to minimize visual impacts, people also want to avoid disruption of wilderness areas and so may be willing to "put up with" lines in the populated corridor. Most people recognize that replacement of 2L1 with a new line, relocated in some sections, would allow reduction of present adverse visual impacts at Whistler and Pemberton. Concerns were expressed on additional clearing necessary on 2L1 ROW to accommodate a 500 kV line.

Vegetation Management

In the study area there is widespread opposition to the use of chemical herbicides (and expecially aerial spraying of herbicides, though this is no longer a B.C. Hydro practice) to control vegetation on the ROWs. The main concern is the possibility of adverse effects on human health from herbicides in domestic water supplies (wells, surface water). Biological vegetation control is viewed as the optimum method, including commerial activity such as cultivation of Christmas trees and edible berries in the ROWs. Several people feel that mechanical and manual means of control could also create job opportunities in areas where unemployment is high.

Property Issues

Individual property owners near the routes studied have concerns about potential disturbances to their land or activities and potential land loss, if the project is built. Most area residents also believe that their property values would be detrimentally affected by the proximity of a new line. Landowners in the Antoine Creek Valley, where there are no lines at present, are adamantly opposed to the construction of any transmission lines near their property.

Possibility of Economic Benefits

Study area residents, especially those in communities losing population because of lack of jobs, are hopeful that the project would provide jobs for local people in clearing, construction or substation maintenance. The number of such jobs is actually very limited. Another economic opportunity that is frequently mentioned is that removal and sale of timber from the ROW could accrue to local businesses. There is also a great deal

of interest in associated project benefits such as the possibility of B.C. Hydro contributing to local efforts to upgrade and maintain the Hiline Road along Anderson Lake, although the Seton Lake Indian Band does not want the road upgraded until their development plans for their land are complete.

PCB Storage

There is some concern, especially in Birken and Pemberton, the communities closest to the Creekside Capacitor Station where PCBs are stored, that B.C. Hydro has not adequately addressed the issue of PCB storage in the study area.

It is noted that B.C. Hydro has given local residents a tour of the PCB storage site at Creekside when the methods of PCB storage and safety precautions were explained. Present physical conditions of storage at this site meet provincial standards. It is considered that this is not a project related concern.

Benefits for Impacted Communities

A broadly based belief throughout the study area is that small rural communities bear much of the cost and reap few of the benefits of developments such as the proposed transmission line. People in the study area have several ideas for appropriate methods of compensating affected communities such as: the initiation of an economic development fund contributed to by B.C. Hydro and other major corporations; the taxation of transmission lines; the development of recreational sites on B.C. Hydro land; and, assistance with local employment such as Christmas tree farming in the ROW.

B.C. Hydro's Relationship with the Public

B.C. Hydro is faced with continuing mistrust and cynicism from area residents, due in part to the series of events associated with the second stage of work on the Kelly Lake-Cheekye Project in 1982. People felt that the public consultation process undertaken at that time was "too little, too late" and that B.C. Hydro did not adequately respond to public concerns. Local residents seem to feel that the current consultation process is keeping them informed but many wonder whether their input will have any effect on project decision-making.

Meager Creek and other Independent Power Producer Sites (IPPs)

There is a concern in the Squamish area over the number of small hydro projects proposed by private developers; the guidelines for assessment and development of small

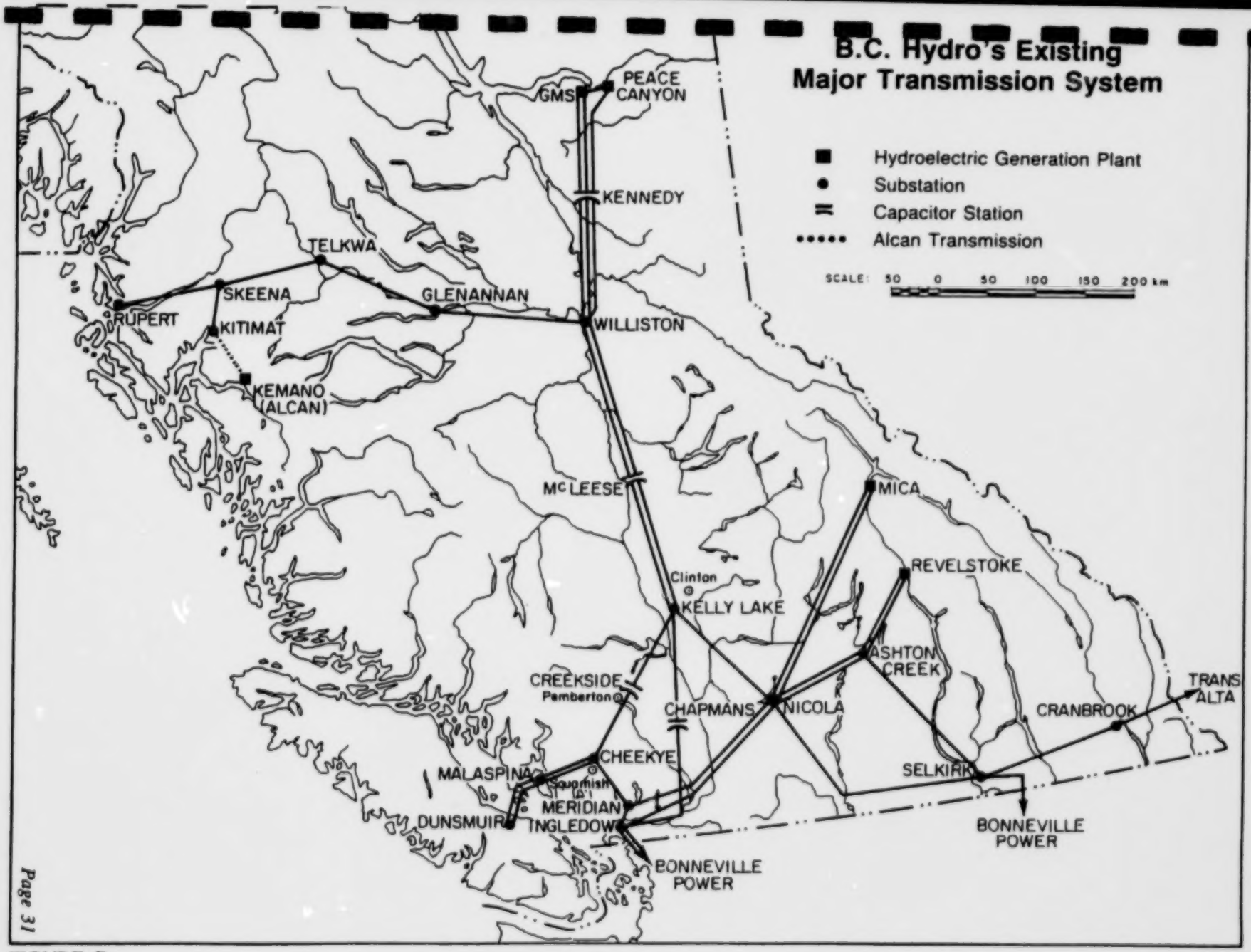

B.C. Hydro's Existing
Major Transmission System
Hydroelectric Generation Plant
Substation
Capacitor Station
Alcan Transmission
SCALE: 50 0 50 100 150 200 km
GMS
PEACE CANYON
KENNEDY
TELKWA
SKEENA
GLENANNAN
RUPERT
KITIMAT
WILLISTON
KEMANO (ALCAN)
McLEESE
MICA
REVELSTOKE
Clinton
KELLY LAKE
ASHTON CREEK
CREEKSIDE
Pemberton
CHAPMANS
NICOLA
CRANBROOK
TRANS ALTA
CHEEKYE
MALASPINA
Squamish
SELKIRK
MERIDIAN
DUNSMUIR
INGLEDOW
BONNEVILLE POWER
BONNEVILLE POWER

FIGURE D

power projects are not well understood by the public. Queries were raised by elected officials in Pemberton and Squamish regarding the future development of thermal power at Meager Creek and the location of transmission lines to connect any generation there to B.C. Hydro's system.

Route-Related Issues

Support for Use of Existing 2L1 ROW

Most residents of the project area contacted to-date have expressed a preference for using the existing 2L1 ROW, if the project is built, to minimize environmental, aesthetic and economic costs. (This position is tempered by the concurrent view that a line should not be placed too close to population centers). This public perspective is also influenced by the possibility of improvements in alignment, as compared to the present 2L1.

Pavilion Route favoured over Antoine Route

Non-native residents in the study area are cognizant of the potential difficulties of routing a new transmission line through the existing corridor over the Pavilion and Bridge River Indian Reserves. However, many of the public in the Lillooet area feel that the Antoine Creek area should be maintained in its present natural state, in part to protect the wildlife populations there. In addition there is a community of about 50 residents living in Antoine Creek and Yalakom River Valleys who are vehemently opposed to any development in their area. They have established their community in a remote area precisely to avoid disruption and have stated their intent to oppose the project being built through the Antoine segment.

Anderson Route favoured over Duffey Route

There is strong support for the Anderson Lake route to avoid intrusion into a scenic area along the Duffey Route, which is being promoted as a tourist route now that the road is being paved. Although some residents along the Anderson-Gates segments may not want to have the line in their valley upgraded to higher capacity, some also feel that the remaining natural areas should be protected.

Whistler

No definitive balance of opinion has yet emerged from Whistler as to whether a route through Whistler is better than a bypass route, or not.

Release of 2L1 land

Many local residents that attended the Open Houses were pleased to learn that the easements forming the 2L1 ROW may be released by B.C. Hydro where the ROW is not required for the new transmission line or other future transmission lines.

SECTION 5.0 COMPARISON OF ROUTE OPTIONS

5.1 General

The opinions expressed in the following comparisons are those of B.C. Hydro's environmental consultants, B.C. Hydro's technical staff, and the public through the ongoing public consultation program.

Route location to-date has occurred with the intent of finding the route of lowest environmental and social impact without consideration of land ownership. Several Indian Reserves are crossed by segments of the route network shown in Figure A. To-date it has not been possible to discuss this project with all the Bands involved and it has not yet been agreed by any Band that they would negotiate a new ROW for this project.

As B.C. Hydro has no power of expropriation on Indian Reserve land it must be recognized that no final route can be determined, if it is proposed to cross an Indian Reserve, until the Band has agreed to provide a ROW.

B.C. Hydro's consultants have not yet been given access to the Indian Reserves in the study area to review site specific impacts and the present conclusions are based on what can be established from aerial photographs, and inspection from the air or highway. Discussion with managers of the reserves and site inspections may bring some changes.

In reviewing route options B.C. Hydro recognized public concerns related to electric and magnetic fields (EMF). B.C. Hydro has used as a siting guideline the results of reviews and studies on these fields undertaken by agencies such as the World Health Organization, the New York State Power Lines Project, Health and Welfare Canada and the Office of Technology Assessment Backgroud Paper for the Congress of the United States. The consensus of these studies, after evaluating all of the available data, is that no risk to human health resulting from exposure to electric or magnetic fields at the strengths encountered under or near power transmission lines has been established. This conclusion was reinforced by the July 1989 decision by the British Columbia Utilities Commission that a 230 kV transmission line in the Courtenay area need not be re-routed because of the EMF. B.C. Hydro does however recognize the ongoing public concern regarding the EMF Issue and where practical has taken steps that will lower field exposures at nearby homes due to construction of the new transmission line.

Over 30 different routes from Kelly Lake to Cheekye can be traced through the network shown in Figure A. By a process of successive comparison of alternate routes through sub sections of the network and elimination of unattractive options, it is possible to reduce the network, leaving a much reduced number for final review, or possibly a single route.

The decisions which have to be made to reduce the network are:

- Selection between Antoine and Pavilion/Mission segments.
- Selection between the existing corridor (Mission, Anderson, Gates segments) and the Duffey segment.
- Selection between the existing corridor and western alternatives (Birkenhead/Owl and Birkenhead/Ryan/Rainbow segments).
- Selection between Whistler and Soo/Rainbow segments.
- Selection of a preference in Lower Cheakamus segment.

A discussion of each of these selections is made in the following sections and summarized in Tables 1 to 10. In reaching the conclusions the following general criteria were used:

- Preference is given to route requiring least permanent change in local environment.
- Preference is given to route with least potential for future impact on environment, example through slope failure or continued erosion.
- Reduction of impact on human settlement is encouraged.
- Preservation of natural areas with high scenic values or importance for wildlife is encouraged.

The opinion of the consultants undertaking the environmental studies can be summarized in five major conclusions:

- Use of the Pavilion/Mission segments would have less environmental impact than use of the Antoine segment.

• Use of the Mission/Anderson/Gates segments would have much less environmental impact than use of the Duffey segment.

• Use of the Birkenhead/Owl segments, or the Birkenhead/Ryan/Rainbow segments, would have greater environmental impacts than use of the corresponding segments in the existing corridor.

• Use of the Whistler segment would have less environmental impact than use of the Soo/Rainbow segments, and would have much less impact if mitigation work is done, such as rerouting of 2L2 south of Whistler. However use of the Soo/Rainbow segments would not have unacceptably high impacts and could be justified if a very high importance was placed on reduction of visual impacts in Whistler, and less importance on locating a line through an area of high future interest for recreation from Whistler, such as for heliskiing or motorized summer and winter recreation.

• Use of the 2L1 ROW by the new transmission line is desirable unless a diversion has significant benefits.

5.2 Antoine versus Pavilion/Mission

The major reason in favour of the Pavilion/Mission route (the existing corridor) is that all impacts are incremental to the present situation and are considered less disruptive than the development of a new route where, for example, new access roads would have to be developed. Detailed specific and significant arguments are:

Terrain

The Antoine segment crosses very difficult unstable terrain on the steep east side of the Fraser Canyon. Construction of an access road and tower foundations would create much visual scarring, with continued ravelling and erosion of cutbanks. Because of the extremely dry climate revegetation is very difficult.

The terrain in the drainage of Antoine Creek is also difficult in that it is very steep, with limited vegetation, and prone to instability. Construction of an access road and tower foundations would lead to much terrain distrubance and the dry climate would make revegetation very difficult.

By contrast, in the existing corridor, the necessary access roads have already been constructed in the sections with difficult terrain, such as the east side of the Fraser

Canyon and the east side of the Camelsfoot Ranges. Any impacts from new construction would be minor.

Wildlife

Construction and operation of the line along the existing corridor would produce an incremental impact on wildlife habitat and disturbance. Use of the Antoine segment would bring disturbance and new access to a new area of the bighorn sheep winter range in the Fraser Canyon, which has recently been enhanced, and to the Antoine Creek Valley which, because of access restrictions, is presently still in its natural condition, and an area known to be important for wildlife.

Visual

Construction along the existing corridor would create an incremental impact in visually sensitive areas such as the views from rafts on the Fraser River, on the Diamond S ranch, and the views westward from Highway 12, but not from any areas of settlement.

Use of the Antoine segment would create new high impacts in visually sensitive areas such as the Fraser Canyon and at Camelsfoot Bend on the Bridge River. It would also have a very severe visual impact on the small community in the Antoine Creek Valley who settled there in recognition of its fine natural setting.

Heritage

The Antoine segment traverses an old Indian village site in Kelly Creek Valley and skirts another at Kelly Creek IR 3 in the Fraser Canyon, it is recognized that these could be protected by careful tower location but the increased access and activity will bring disturbance. Impacts along the existing route have already largely occurred, but two important sites exist near Cutoff Creek, and an area of high potential at the Bridge River crossing.

Social

The existing corridor skirts all areas of settlement. At the Pavilion Indian Reserve the line is out of sight of the village. The Antoine option cannot avoid running very close to the small settlements in the Antoine Creek Valley and at its junction with the Bridge River.

The Antoine route creates a new hazard for aircraft in the Fraser Canyon, if the existing corridor is used no new hazard is created.

If the existing corridor is favoured it is necessary to determine a preference for the sub-

options at Pavilion. Option CE, the existing corridor, is highly preferred over CDE for the following reasons:

Visual

CDE requires two crossings of Highway 12, and a traverse of the benchlands on the east side of the Fraser Canyon in the foreground of the view across to the Camelsfoot Range from the highway, without the benefit of any screening by trees.

Agriculture

CDE requires a crossing of the irrigated hayfields on the east side of the Fraser Canyon, towers would disrupt the wheeled irrigation system.

Hazard

Use of CDE separates the crossings of the Fraser Canyon by 1 kilometre increasing the hazard to light aircraft.

5.3 Duffey Segment versus Mission/Anderson/Gates Segments.

Again the major environmental reason in favour of use of the existing corridor is that the impacts of construction are incremental, and the impacts of operation are virtually zero as the new line would replace an existing line, or be adjacent to an existing line. By contrast use of the Duffey segment requires construction and operation in a valley presently unencumbered by transmission lines.

The major specific reasons are:

Terrain

The terrain of the Cayoosh Canyon is very unfavourable for construction of a transmission line. It would involve construction of foundations in highly weathered rock on very exposed steep ridges. In the Duffey Lake section there is a considerable avalanche hazard. By contrast, except for some short sections in the Gates River Valley and Whitecap Creek, the existing corridor offers relatively easy terrain conditions for construction of transmission lines, with limited exposure to hazards.

Forestry

The valleys of Joffre and Cayoosh Creeks present a better opportunity for commercial forestry than those of the drier existing corridor.

Wildlife

Use of the existing corridor will create only minor habitat changes and few significant impacts for wildlife. Use of the Duffey segment will bring new disturbance to the Cayoosh Ranges, a high quality habitat for mountain goat.

Visual

The provincial government will complete upgrading of the Duffey Lake road in 1990, turning it into a highly popular tourist route. The adverse visual impacts of construction in the confined landscape of the Duffey segment, particularly in the Cayoosh Canyon, will be much greater than the incremental impacts of construction, largely on an existing ROW, in the existing corridor, especially when mitigated by proposed relocation in Gates River Valley, and at D'Arcy.

The Village of Lillooet is opposed to use of the Duffey segment because a 500 kV transmission line skirting the western edge of the village would be highly visible.

The Village of Lillooet and Squamish Lillooet Regional District both advised they desire to see continued use of the existing corridor so as to prevent intrusion of transmission lines into new areas, and to maintain a high quality visual experience along the upgraded Duffey Lake road which they anticipate becoming a major tourist route.

Land Use

Use of the Duffey Lake segment would require a new ROW through Mount Currie Indian Reserves 6 and 7, and adjacent to the new village. The Mount Currie Band has stated its opposition to this because of the proximity to the village, and the use of developable land for a ROW.

With the alignment proposed in the Gates River Valley and removal of 2L1 many of the existing constraints on land use on the narrow valley floor are removed. Further reductions in constraints on land use could be achieved in Birkenhead River Valley. B.C. Hydro proposes to review this section.

5.4 Birkenhead/Owl Segments versus Gates/Pemberton Segments

The environmental impacts of transmission line construction and operation vary directly with the difficulty of the terrain and with the length of the line. The Birkenhead/Owl option is 6 kilometres longer than the Gates/Pemberton option (the existing corridor) and requires construction over a major mountain ridge system, as compared to construction

in a valley. Further improvements in alignment are possible in the Gates and Pemberton segments.

The most important factors in favour of the existing corridor are:

Terrain

Construction in the sub alpine and alpine zones over the ridges of the Owl and Fowl drainages would create considerable adverse impacts relative to construction in the valleys below.

Water

Use of the Birkenhead/Owl option requires a quality crossing of the watershed for the Village of Pemberton. Clearing and maintenance of the ROW might cause siltation.

Agriculture

The Birkenhead/Owl option would create a new ROW across the farmlands of the Lillooet River Valley, interfering with machinery operations. Use of a ROW adjacent to an existing ROW should cause fewer problems.

Recreation

The Ministry of Parks is adamantly opposed to a route through Birkenhead Lake Park. It is recognized that there would be severe visual impacts as the route would lie along the southeast side of the lake, crossing the slope through a closed canopy forest at some height above the lake to avoid the alluvial fans located at the bottom of the gullies.

A provincial park is planned for the highly scenic alpine area of the Owl and Fowl Creek drainages. Construction and operation of the transmission line would detract significantly from the enjoyment of this area.

Visual

The Birkenhead/Owl option will be highly visible in its crossing of the Birkenhead Valley, the descent into the Lillooet River Valley, its skirting of the west and south sides of Pemberton, and at its crossing of Nairn Falls Provincial Park. However its use would permit removal of one transmission line in the existing corridor between D'Arcy and Pemberton.

The level of visual impacts in the existing corridor would be incremental, and should be reduced by diversion from the 2L1 ROW in the Gates River Valley and

through Pemberton, although the diversion at Pemberton would have adverse visual impact where a new ROW would be cleared over Signal Hill.

5.5 Birkenhead/Ryan/Rainbow Segments versus Gates/Pemberton/ Green/Whistler Segments

Use of the Birkenhead/Ryan/Rainbow option results in a construction length of 100 kilometres, as compared to 78 kilometres in the existing corridor, through much more difficult terrain, in general environmental impacts are directly proportional to length. Major mountain ridges are crossed at the head of Tenas and Ryan Creeks, between Rutherford Creek and Soo River, and through the pass west of Rainbow Mountain.

The impacts of construction and operation of the line in the Birkenhead/Ryan/Rainbow segments would be much higher than for construction and operation in the existing corridor. Significant differences in impact are:

Terrain

The headwater areas of Tenas and Ryan Creeks represent very difficult terrain for construction and operation of transmission lines, due to steep slopes, and frequency of rock slides and avalanche areas. In particular the section in Ryan Creek poses considerable hazard to a transmission line, although technical staff consider a route is possible.

The use of a route over mountain ridges in the Coastal Mountains at the elevations shown below presents considerable problems for maintenance, or emergency repairs, under winter conditions.

Between Tenas Creek and Lillooet River	1980 metres (6500 feet)
Between Ryan and Rutherford Creeks	1675 metres (5500 feet)
Between Rutherford Creek and Soo River	1645 metres (5400 feet)
Pass west of Rainbow Mountain	1310 metres (4300 feet)

Forestry

Use of the existing corridor requires use of much less productive forest land than the Ryan Option.

Wildlife

Use of the Ryan option will result in a major disturbance of an existing wilderness area centered on Ryan Creek Valley that is important to mountain goats and grizzly bear. This area is the closest viewing site for the latter to Vancouver.

Recreation

The Ryan option has the same adverse impacts in Birkenhead Lake Provincial Park as discussed in Section 5.4. It also crosses the same proposed provincial park located in the alpine areas of Owl Creek drainage and Tenquille Lake, creating the same adverse impacts.

In using the pass west of Rainbow Mountain, and the Callaghan River Valley, it traverses an area of considerable future interest to the Resort Municipality of Whistler. The Municipality and the provincial and regional governments have yet to agree on plans for the area. It is known that both the Ministry of Parks and Ministry of Forests have recreation or park plans for the Callaghan Lake and Powder Mountain areas.

Visual

The Ryan option would have high visual impacts in Birkenhead Lake Provincial Park, at the settlement at the south end of Birkenhead Lake, and at the crossing of the Lillooet River Valley, where the ROW would be highly visible on the slopes on each side of the valley. However, use of this option would allow the removal of one transmission line between D'Arcy and Daisy Lake, which would reduce present levels of visual impact in the existing corridor.

Social

Many people expressed a desire to limit transmission lines to existing corridors, particularly when the line is a replacement, rather than impact new areas. The Ryan option represents the greatest intrusion into wilderness areas of any of the options reviewed.

5.6 Soo/Rainbow Segments versus Whistler Segment

Comparison of these options involves a decision between a new route penetrating an area of no settlement, but one of heavy forestry use with recreation interest, and the incremental impact of use of an existing corridor.

The conclusion of the consultants was that each option could be constructed and operated within an acceptable level of environmental impact, but that use of the existing corridor, mitigated by use of the proposed new alignment from Alta Lake to Daisy Lake, would result in lower impacts to biophysical resources.

Significant issues in this choice are:

Terrain

The pass west of Rainbow Mountain is a difficult area for transmission lines as it is subject to avalanches from the east and a rock slide on the west. Field studies indicate that a secure route can be found for one 500 kV transmission line.

Wildlife

Construction and operation of the line would disturb wildlife in the Soo River wetlands. Construction in the existing corridor would result in temporary impacts in the wetlands between Green and Alta Lakes as 2L1 was removed and the new line constructed.

Forestry

The Soo/Rainbow option requires the use of 41 kilometres of ROW in productive forest land as compared to about 23 kilometres in the existing corridor, excluding that portion of the segment through settled areas.

Recreation

The Rainbow Mountain, Callaghan Lake, Callaghan and Powder Mountain arc is seen as important for summer and winter recreation based in Whistler. Concern has been expressed by many about crossing this area with a transmission line before plans for its future have been established. The Soo and Callaghan Valleys are seen as offering excellent potential for recreation in winter and summer and becoming important as access corridors to other recreation areas. The Ministry of Crown Lands is concerned about the visual impacts, and safety, in relation to heli-ski operations in this area.

Visual

Use of the Soo/Rainbow option would remove one transmission line from the Resort Municipality of Whistler. However from the north end of Green Lake to the north end of Alta Lake the line to be removed would be the centre line in an arrangement of three parallel lines, resulting in only a limited benefit.

Coming south, the line to be removed is on the bench west of Alta Lake, the two lines near Alta Lake would remain. South of Tamarisk to Daisy Lake one of the two lines close to the highway (2L1) would be removed. This last benefit would also be achieved by use of the revised alignment proposed for the existing corridor between Alta Lake and Daisy Lake. In total there would be very little visual benefit in Whistler from using the Soo/Rainbow option.

Visual impact in the Soo/Rainbow route would be high as the line lies totally within a scenic natural area.

Social

The decision to be made between these routes is one of differing social values, reduction of visual impacts in a developing community compared to acceptance of greater environmental impacts and adverse impacts on possible future development of the recreation land base for Whistler.

5.7 Lower Cheakamus Sub-Options

It was proposed in earlier studies to use the existing 2L1 ROW through this area, but as the study progressed issues emerged requiring a review of some alternates. Local residents opposed to the replacement of 2L1 requested a review of routes other than the existing ROW. It became apparent that the 2L1 ROW was so close to the North Vancouver Outdoor School that location of a 500 kV line with additional clearing would be very difficult. An unresolved dispute exists over the existing ROW on the Cheakamus Indian Reserve. It was therefore decided to study the sub-options shown in Figure A.

These are now reviewed in the following sequence:

PR (west sub-option) versus PQR (existing ROW).
RST (south sub-option) versus RT (existing ROW).
QS (east sub-option) versus QRS (existing ROW).

PR versus PQR

Terrain

Use of PR would require construction on steep sidehill while PQR is on the valley floor with a developed access road. Use of PR would have much higher adverse impacts, such as erosion.

Visual

The PR route would be visible for most of its length from Highway 99 as a cut across a forested slope in the middle ground of a dramatic view of the Tantalus Range. The PQR route is not visible from the highway. In addition the PR route may be visible to all residents in the lower Cheakamus Valley because of its location high on the steep hillside while a transmission line on the existing ROW is screened by trees from many residents.

Fish

The Cheakamus River is a highly prized sport fishery. Use of the PR route which parallels it, might result in siltation of the river until a vegetative cover was restored. Because PQR is a mature ROW no siltation from it is anticipated.

Forestry

Use of PR would remove land from the commercial forest land base, as PQR lies mainly on private leases it is doubtful if any trees grown on it after removal of 2L1 would contribute to the commercial forest land base.

Social

During the project Open House held in Squamish and in subsequent correspondence, a number of residents of the Cheekye/Paradise/Cheakamus Valley area stated their opposition to a second line through the Valley and to replacement of the existing 230 kV circuit 2L1 with a new 500 kV line on the same ROW. Concerns with environmental impacts, electric and magnetic fields and use of herbicides are noted as the rationale for this position. They requested that an alternate route - removed from populated areas - be found. The use of PR would be one such alternate route.

With respect to electric and magnetic field (EMF) effects on health of the World Health Organization, the New York Power Lines Project, Health and Welfare Canada and the Office of Technology Assessment Background Paper to the Congress of the United States, after evaluating all of the available data, is that no risk to human health resulting from exposure to the EMF from power transmission lines has been established. Within British Columbia this conclusion is supported by the B.C. Utilities Commission Inquiry in July 1989 regarding the possible relocation of a line due to EMF. That inquiry concluded, in part, "There is, however, insufficient evidence to support a presumption of an actual health risk. This conclusion holds for ... residences close to high voltage transmission lines." B.C. Hydro does however, recognize that there are ongoing concerns regarding EMF exposures and where practical has taken steps that will lower field exposures at nearby homes due to construction of the new transmission line.

Conclusion

From an environmental perspective, the use of the existing ROW (PQR) is better than PR. This is supported on technical grounds as no new access is required, and there are fewer angles. However, local residents have expressed opposition to the use of the existing ROW (PQR).

RST versus RT

Terrain

RT is located on the flood plain of the Cheakamus River and the alluvial fan of Cheekye River. No adverse impacts are anticipated from use of the existing ROW.

RST rises from the flood plain onto the rock bluffs east of the Cheakamus River, traverses the edge of the bluffs and then descends to Cheekye across the alluvial fan of Cheekye River.

It is considered that use of RST would have more impact on terrain but the extent would be determined by the amount of new access road required. If helicopter construction was used along the bluffs terrain impacts would be low.

RST is less exposed to hazard as it is less threatened by erosion from the Cheakamus River or debris flows in Cheekye River, which are relatively frequent.

Visual

The RT route is adjacent to the Cheakamus valley access road from the North Vancouver Outdoor School north for 2 kilometres. The extra clearing required for a 500 kV line would probably remove much of the limited screen of trees between the road and the school. If the new line were switched to the west side of the road to protect the screen of trees then it would require clearing of old cedar trees which are highly regarded for education with information trails established through the grove.

The RST route becomes exposed to southbound travellers in the Cheakamus Valley where it ascends the steep rock bluff at S. The visual impact of this is reduced in that no clearing is required. The route is not visible from Highway 99 or Brohm Lake.

Fish

Use of RST avoids two crossings of Cheakamus River.

Recreation

Brohm Lake is an important Ministry of Forests recreation site, the RST route would only be visible to those that walk westwards to seek a view into the Cheakamus Valley.

Forestry

RT is almost all over private land (North Vancouver Outdoor School 2.5 kilometres, Cheakamus Indian Reserve 0.5 kilometres, others 2 kilometres) of high forest capability.

RST is located on rock bluffs for 4 kilometres with only 2 kilometres on high capability land.

Social

The North Vancouver Outdoor School has expressed its concerns on use of the 2L1 ROW since 1983. It is recognized that a 500 kV line could not be located on the existing ROW without the additional clearing bringing major changes to the local environment of the school.

The School staff have requested that, if RST is used, the caves at the base of the bluff near S not be disturbed by construction of the line.

The Squamish Indian Band stated in 1983 that there was a dispute over B.C. Hydro's entitlement to use the 2L1 ROW over the Cheakamus reserve. Their preference at that time was that the existing line be removed and not replaced. Their present position is not known.

Heritage

A mythological site of the Squamish Indians has been identified at the bluffs north of S. The site is a natural stone face overlooking the river and marks the site of an event in one of the myths of the Squamish Indians. The site is known as 'Wountie' and is judged to have considerable heritage significance.

Conclusion

RST is favoured as it avoids the Outdoor School, where impacts would be high, and the Cheakamus Reserve, which is the preference stated by the Squamish Indian Band in 1983 and because there is very little other difference in environmental impacts, provided that an alignment is found which does not impair the mythological site.

<u>QS versus QRS</u>

Terrain

QS runs for 8 kilometres on a series of rock benches above the east side of the Cheakamus. The degree of terrain disturbance would depend on whether

construction of access roads is required or whether helicopters would be used. QRS runs on the flat valley floor, with access already provided, except for the short ascent to S.

Visual

The south 4 kilometres of QS would be highly visible from Highway 99 with towers and conductors located in the foreground of the dramatic view west to the Tantalus Range. The whole length would be very visible from the floor of the Cheakamus Valley.

By contrast QRS is not visible from the highway and when on the valley floor is so screened by trees that only short sections would be visible from homes in the Cheakamus Valley.

Forestry

In QRS 5 kilometres is on alienated land and 3 kilometres on Crown land. All of QS is on Crown land, so use of QS will result in a reduction in the commercial forest land base, even though QRS represents better quality sites.

Heritage

Use of QS would avoid the mythological site identified at the bluffs below S.

Social

Please refer to the comments in the previous comparison of PR versus PQR with respect to the concerns of local residents about the use of the existing ROW and their request that an alternate route be found. QS is another such alternate route.

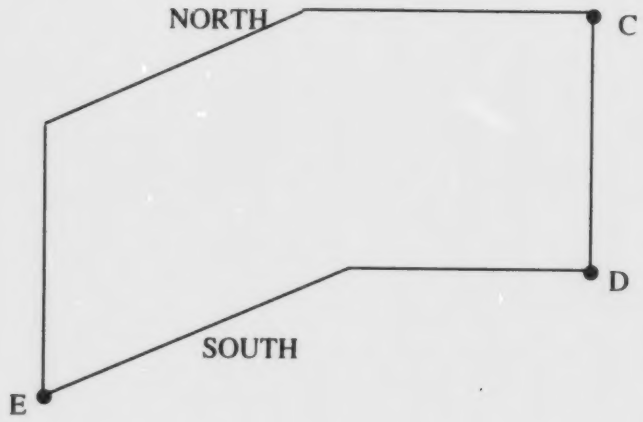
Conclusion

From an environmental perspective the use of QRS has much lower visual impact than QS and is better on that ground, provided a route can be found that does not impair the mythological site. However, local residents have expressed opposition to the use of the existing ROW.

The generally favored route is the south sub-option, namely RST, which avoids the Outdoor School and the Cheakamus Indian Reserve. However further analysis and discussion is required before a conclusion can be reached among the three alternatives (the west and east sub-options and the existing route), for that area north of the Outdoor School. The environmental consultants are of the opinion that the use of the existing ROW is better than the east and west sub-options described above, whereas residents are opposed to the use of the existing ROW.

TABLE 1
SUMMARY COMPARISON OF ROUTE OPTION

	Length (km)	Transmission Cost (see Note 1, Table 1) (M$)	Environmental Factors	Technical Considerations
1. Fraser Crossing	CE 6.9 CDE 6.2	CE 3.6 CDE 3.2	CDE has high visual impact with crossing of 5L41, 2 highway crossings and new river crossing, and makes new intrusion into bighorn sheep range. CDE requires crossing of irrigated fields. CE is adjacent to existing TL, minimal new access is required.	CE has access already developed. CE avoids creating a new hazard for aircraft. The necessary crossing of 5L41 is more difficult on CDE.



Note 1.

The costs shown for each route option are preliminary estimates providing only order-of-magnitude costs. They include direct costs (e.g. costs of engineering, survey, clearing, and construction) plus an allowance for inflation and for indirect costs (e.g. corporate overheads and interest during construction) determined as 50% of the direct costs. Not included are costs associated with transmission line losses, transmission line maintenance, and the removal of existing circuit 2L1.

TABLE 2
SUMMARY COMPARISON OF ROUTE OPTION

	Length (km)	Transmission Cost (see Note 1, Table 1) (M$)	Environmental Factors	Technical Considerations
2. Antoine versus Pavilion/Mission	BG 44 BCEFG 44	BG 35.7 BCEFG 25.2	BCEFG involves construction on an existing ROW from B to C and along an existing corridor from C to G. BG is a new route. Along BG there are severe problems with difficult terrain along Cavanagh and Antoine Creeks. BG crosses high value wild-life habitat in Fraser Canyon, Antoine Creek and Bridge River valleys. Visual impact of BG is higher at Fraser and Bridge River crossings because new, more attractive sites are affected. Two large important heritage sites lie along BG. BG has severe impact on small community in Antoine Creek valley, while BCEFG avoids Pavilion village and other settlements but crosses Pavilion and Bridge River Reserves. Wilderness value of Antoine Creek Valley is lost.	The terrain conditions along BG give problems for access roads, foundations, and site restoration. Terrain along BCEFG is steep, and access, although difficult, is established.

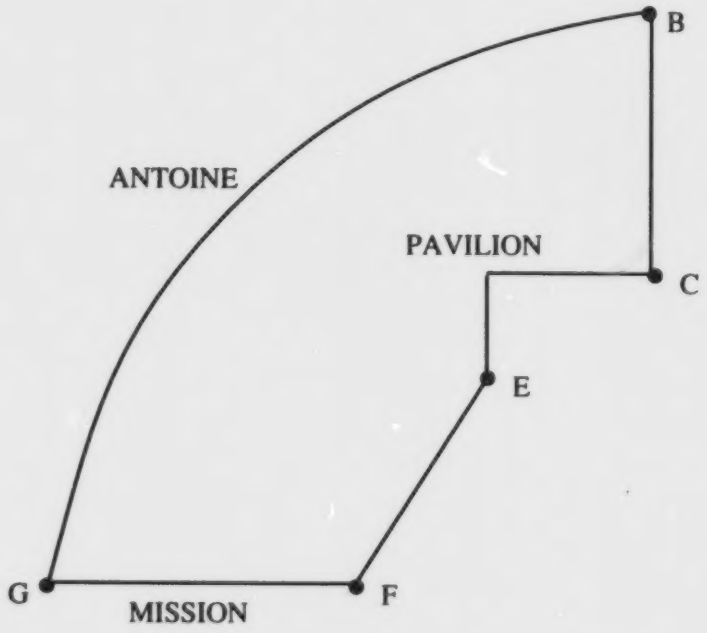


TABLE 3
SUMMARY COMPARISON OF ROUTE OPTION

	Length (km)	Transmission Cost (see Note 1, Table 1) (M$)	Environmental Factors	Technical Considerations
3. Duffey versus Mission/Anderson/Gates	FJ 89 FGHJ 80	FJ 86.0 FGHJ 59.0	FGHJ involves construction along an existing corridor with an existing ROW available south of Seton Portage. South of Lillooet GJ involves construction in a new corridor well accessed by the Duffey Lake road. Wildlife, forestry, and visual impacts are considered high along FJ south of Lillooet. Particular concern has been expressed on the visual impacts as there is expectation that the Duffey Lake road will become an important tourist route. There would be adverse impacts at B.C. Hydro's Seton Lake Recreation Area, Joffre Lakes Recreation Area and Proposed Duffey Lake park. Use of FJ would reduce visual impacts from Seton Portage to J when 2L1 is removed. FJ would impact irrigation of fields north of Lillooet, be highly visible from Lillooet, and cross the Bridge River, Lillooet, and Mount Currie Indian Reserves. There is opposition to use of FGHJ in Gates River Valley. A new route has been identified to reduce visual impacts and land use conflicts, which has satisfied some opponents. Route adjustments are also proposed at D'Arcy to reduce visual impacts. FGHJ crosses Indian Reserves at Seton Portage, D'Arcy, and near J.	Along FJ there are very difficult terrain conditions for 10 kilometres in Cayoosh canyon with its steep walls. There are only very limited terrain problems in FGHJ B.C. Hydro has lost towers due to debris in snow slides on the big burn southwest of Seton Portage. The trees on this are gradually growing and should soon arrest the slides. There is greater avalanche potential on FJ. FGHJ has established access roads; FJ would require extensive development of access roads. 5L42 was constructed to very conservative standards over Mission Ridge because of predicted severe icing. This has not occurred so for 5L46 more conventional standards are proposed.

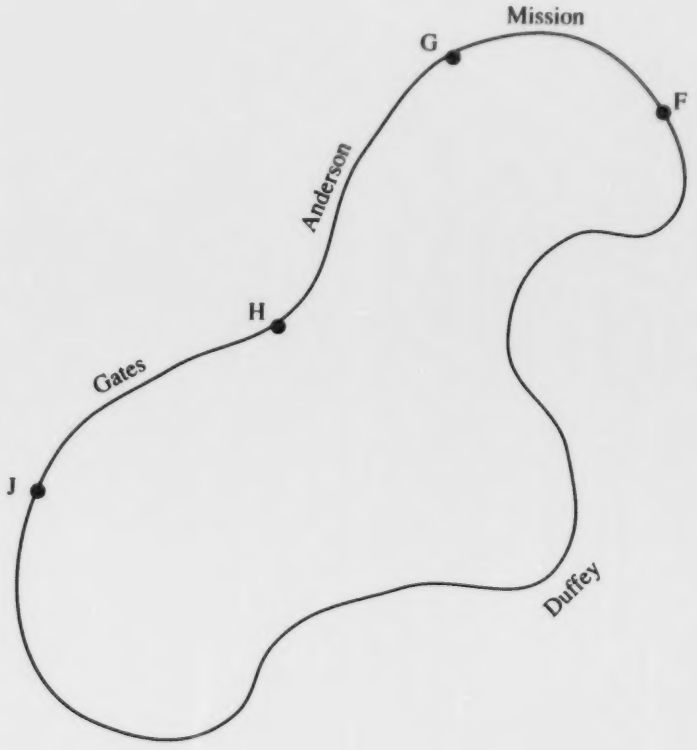


TABLE 4
SUMMARY COMPARISON OF ROUTE OPTION

	Length (km)	Transmission Cost (see Note 1, Table 1) (M$)	Environmental Factors	Technical Considerations
4. Antoine/Anderson/Gates versus Pavilion/Duffey	BFJ 108 BGHJ 109	BFJ 101.0 BGHJ 84.5	The issues along BG and BF are discussed in Table 2 , and in GHJ and FJ in Table 3. BGHJ avoids the Pavilion and Bridge River Reserves, and reserves between G and J could be avoided if necessary. However it has severe impacts on the small settlement in Antoine Creek Valley. BFJ requires new right of way on the Pavilion, Bridge River, Lillooet, and Mount Currie Reserves.	See left

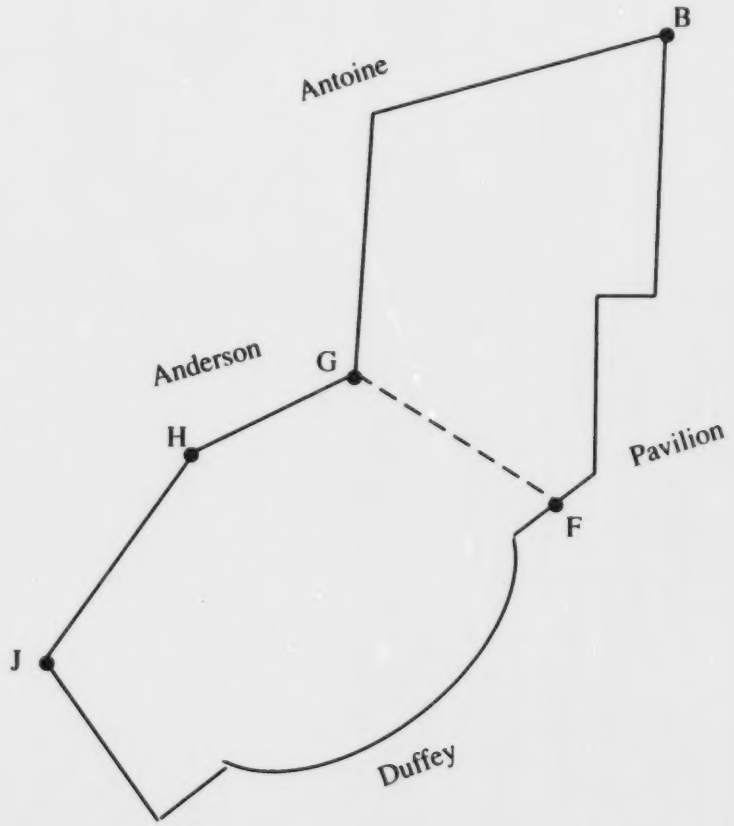


TABLE 2

SUMMARY COMPARISON OF ROUTE OPTION

	Length (km)	Transmission Cost (see Note 1, Table 1) (M$)	Environmental Factors	Technical Considerations
5. Birkenhead/Owl versus Gates/Pemberton	HIK 45 HJK 38	HIK 42.8 HJK 26.0	HJK involves construction in an existing corridor. HIK is a new route. HIK has severe visual impacts in Birkenhead Lake Park and Mount Ronayne Park proposal and at Pemberton. It reduces visual impacts in existing corridor when 2L1 removed. HIK requires a new ROW across farm land in Pemberton Valley and clearing in watershed of Pemberton. There is opposition to use of HJ from residents of Gates River Valley. A new route has been identified on the south side of the valley to reduce visual impacts and land use conflicts, which has satisfied some opponents. The cottage owners at Birkenhead Lake are very opposed to HIK. Both options would result in 2L1 being removed from south approach to Pemberton and from within Pemberton.	HJK is a valley route with good access. HIK requires crossing of sub-alpine terrain at an elevation of 1300 metres. Heavier, more expensive, structures would be required in high elevation section. New access required in steep terrain in HIK with difficult construction conditions.

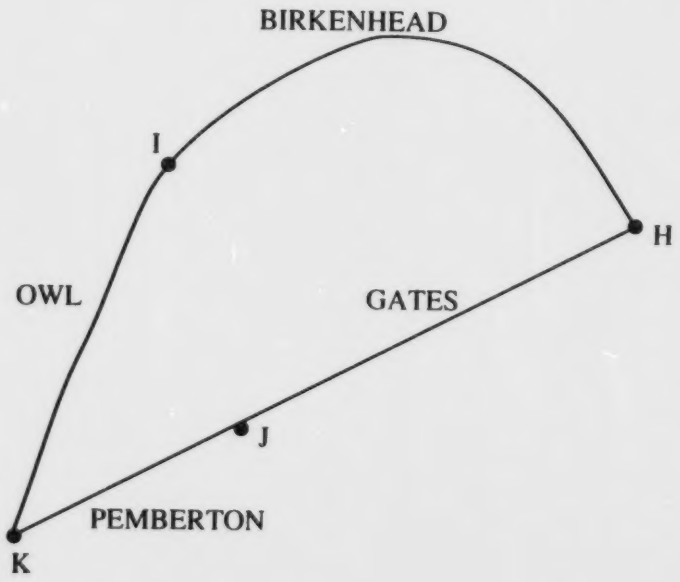
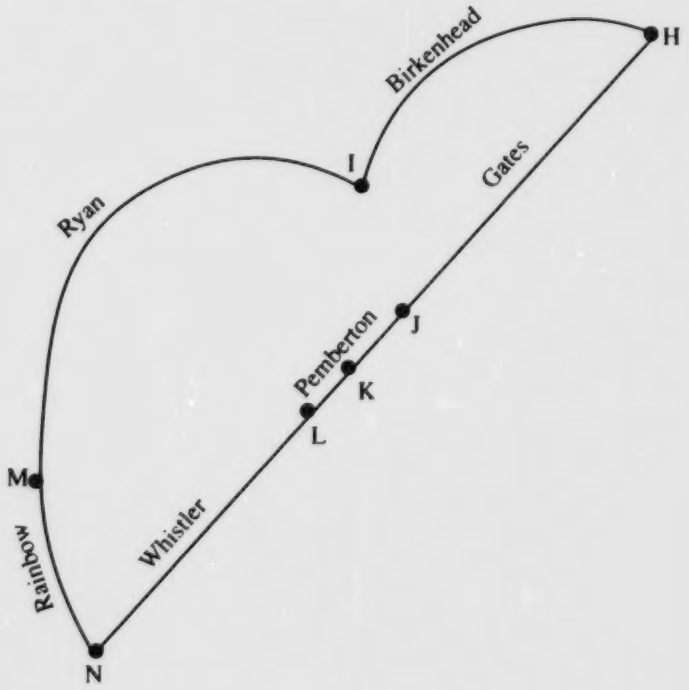


TABLE 6
SUMMARY COMPARISON OF ROUTE OPTION

	Length (km)	Transmission Cost (see Note 1, Table 1) (M$)	Environmental Factors	Technical Considerations
6. Birkenhead/Ryan/Rainbow versus Gates/ Pemberton/Green/Whistler	HIMN 100 HJKLN 77	HIMN 99.9 HJKLN 53.6	HIMN is an entirely new route mainly through sub-alpine wilderness or rugged forested valleys. HJKLN involves construction in an existing corridor. HIMN has high impact on forestry and wildlife. Visual impacts are high at Birkenhead Lake Park, Mt. Ronayne Park Proposal, Pemberton Valley, and in Rainbow Pass. It reduces visual impacts in existing corridor from H to N when 2L1 removed. There is opposition to use of HJ in Gates River valley, but a route has been identified on south side of valley that satisfies many opponents. There is a desire in Pemberton to move transmission lines out of the village. Both options achieve this for 2L1. The use of HIMN would remove the centre of three lines from Whistler, which is seen as a benefit by some, but the reduction in visual impact is low. West of Whistler use of a new route is proposed in existing corridor to reduce visual impact along Highway 99. HIMN imposes land use restrictions on farm land in Pemberton Valley and reduces recreation potential of lands west of Whistler.	HJKLN is a valley route with good year round access. HIMN involves crossing four mountain ridges or passes to elevations of 1980, 1675, 1645 & 1310 metres in region of high snow-fall and conductor icing. Restrictions on maintenance and construction are severe. Construction in upper Ryan River drainage would be very difficult. Mountain sections have high avalanche hazard, extensive lengths of helicopter access would be necessary.



SUMMARY COMPARISON OF ROUTE OPTION

	Length (km)	Transmission Cost (see Note 1, Table 1) (M$)	Environmental Factors	Technical Considerations
7. Soo/Rainbow versus Whistler	LMN 41 LN 37	LMN 34.1 LN 26.1	LN involves construction in an existing corridor. LMN is a new route. LMN has high forestry impacts, and visual impact in Soo Valley and Rainbow pass, possibly affecting recreation potential of land of future importance to Whistler. It reduces visual impacts from L to N when 2L1 removed. The use of LMN would remove the centre of three lines from Whistler, which is seen as a benefit by some, but the reduction in visual impact is low. A new route is proposed in LN west of Whistler to reduce visual impacts along Highway 99 and in Brandywine Park.	In LN it is necessary to use some piled foundations across wetlands at Whistler. LN is all in valley with good access, LMN involves rising to an elevation of 1310 metres at Rainbow Pass in a high snowfall area with adjacent avalanche area on north side, and potential for conductor icing.

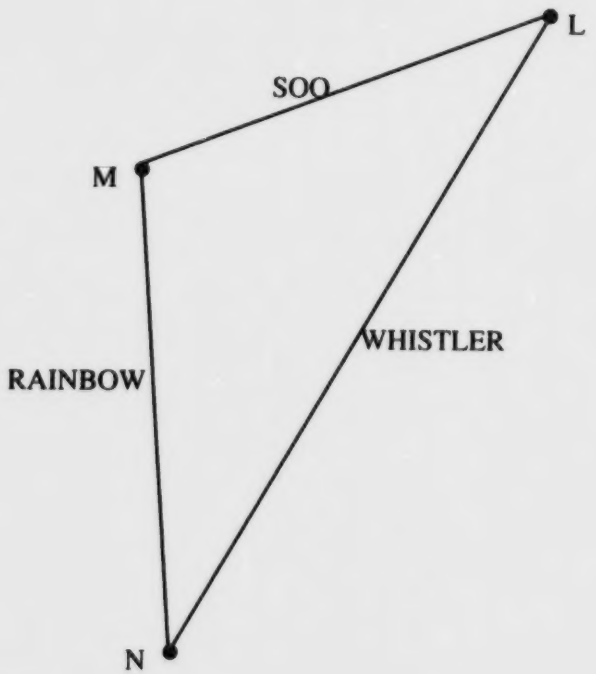
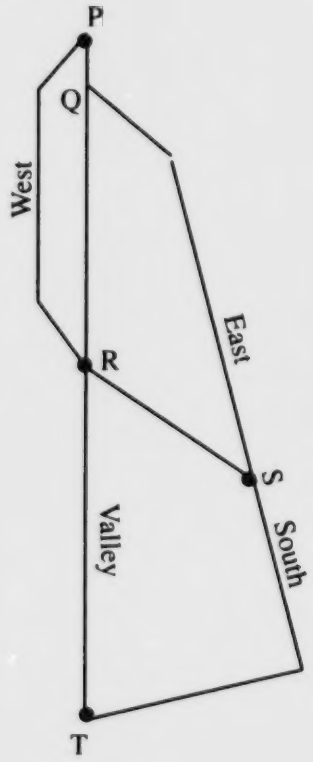


TABLE 8
SUMMARY COMPARISON OF ROUTE OPTION

	Length (km)	Transmission Cost (see Note 1, Table 1) (M$)	Environmental Factors	Technical Considerations
8. Cheakamus west versus Cheakamus valley	PR 10 PQR 9	PR 8.6 PQR 4.8	PQR is an existing 2L1 ROW. PR is a new route. PR is highly visible from highway and valley, it has high forestry impacts, and high potential to impact fish in Cheakamus River due to erosion from ROW on steep sidehill. Residents in valley would prefer route other that 2L1. However not many live close to ROW.	PR has very poor access, QR has mature ROW on valley floor. New ROW is required for PQ.



SUMMARY COMPARISON OF ROUTE OPTION

	Length (km)	Transmission Cost (see Note 1, Table 1) (M$)	Environmental Factors	Technical Considerations
9. Cheakamus south versus Cheakamus valley	RT 5 RST 6	RT 2.3 RST 4.8	RT is on existing 2L1 ROW. RST is a new route. RT is very close to buildings of North Vancouver Outdoor School, further clearing would detract from school. Existing ROW is contested in Cheakamus IR. RST is screened from Cheakamus Valley, except for rise onto bluff near R, from Brohm Lake and Highway 99.	RT is existing mature ROW on flood plain with good road access. RST crosses river onto rock bluffs and proceeds south in rocky area with limited access.

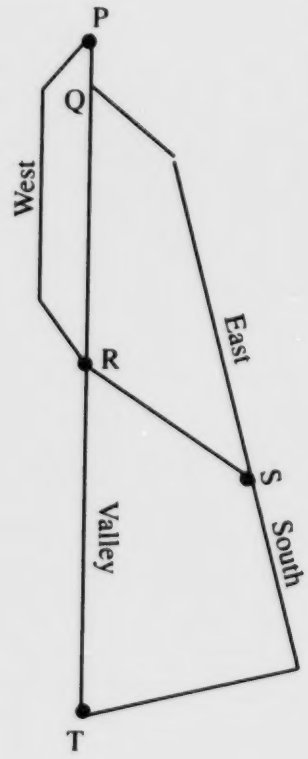
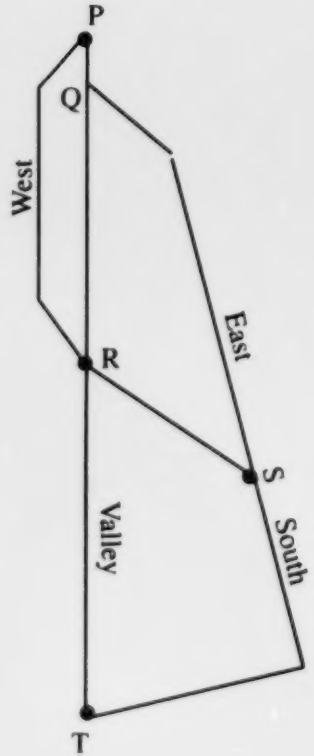


TABLE 10
SUMMARY COMPARISON OF ROUTE OPTIONS

	Length (km)	Transmission Cost (see Note 1, Table 1) (M$)	Environmental Factors	Technical Considerations
10. Cheakamus valley versus Cheakamus east	QRS 9 QS 10	QRS 4.5 QS 7.8	QRS is on existing mature 2L1 ROW from Q to R and new ROW from R to S. QS is all new. QS is highly visible from highway and valley. QRS is only visible in RS section where it rises onto bluffs. Residents in valley would prefer route other than 2L1, but not many live close to 2L1.	QS is on rock bluffs with no road access. Helicopter construction necessary to avoid high road costs and visual impacts. QR uses existing ROW on valley floor. RS is only 2 kilometres, but rises steeply to bluffs.



SECTION 6.0 THE GENERALLY FAVORED ROUTE

The opinion of the majority of the public, as expressed to-date at many meetings and eight open houses is that it would be favorable to follow the existing transmission line corridor, where possible. B.C. Hydro's environmental and social consultants, namely that use of the existing corridor has real advantages over use of other route options. B.C. Hydro's technical and cost studies also reach the same conclusion. At this point therefore, apart from Whistler and the Lower Cheakamus area, there appears to be broad general agreement in favour of use of the existing corridor including route changes at D'Arcy, Gates River Valley, Pemberton, and in the Upper and Lower Cheakamus Valley off the 2L1 ROW. At Whistler no firm opinion has yet emerged on route selection.

The suggestion that the existing transmission line corridor is generally preferred is still tentative as the formal opinion of most of the Indian Bands has not yet been obtained. The validity of this will be tested by distribution of this report, discussion of the project with the Indian Bands, and further public consultation undertaken by B.C. Hydro. If agreement on a ROW cannot be reached with Indian Bands along the route, it will be necessary to develop route variations to avoid the reserves.

Following further public consultation and providing there are no major changes in public opinion, B.C. Hydro would apply to government for an Energy Project Certificate to construct the project in the existing corridor, using the revised alignment described at all open houses. The exceptions are the Whistler and the Lower Cheakamus areas. In Whistler both options will be carried forward pending further detailed consultation with provincial agencies, the Squamish Lillooet Regional District, the Resort Municipality of Whistler, and the public. In the Lower Cheakamus area further study and discussion is required to arrive at agreement on a route north of the Outdoor School. It is however proposed to by-pass the school.

Social and Environmental Issues of Generally Favored Route

The social issues which would have to be addressed in planning, construction, and operation of a transmission line along the existing corridor are as follows:

a. Negotiation of an agreement for new ROW with Pavilion, Bridge River, Seton Lake, and Anderson Lake Indian Bands, and other property owners.

b. Protection of water intakes and quality along Seton and Anderson Lakes and in Gates River Valley.

c. Determination of future management for "Highline" road along Anderson Lake and upper Cheakamus Valley road after completion of construction.

d. Further refinement of alignment in Gates and Birkenhead River Valleys and at Pemberton.

e. Further review of routing at Whistler and the Lower Cheakamus area.

f. Discussion with Mount Currie Indian Band on present ROW across Lokla Indian Reserve.

g. Discussion with Squamish Indian Band on present ROW across Cheakamus Indian Reserve.

h. Further explanation of electric and magnetic field effects to any concerned parties.

i. Determination of job opportunities and economic benefits that may accrue for local contractors and residents.

j. Consideration of way of mitigating effects of project in communities.

The environmental issues which have yet to be addressed in planning, construction and operation of a transmission line along the existing corridor are as follows:

a. Confirmation of final alignment.

b. Determination of environmental protection plan for construction and operation phases.

c. Preparation of a site-specific plan for access to ROW to limit potential adverse impacts.

d. Environmental review of any refinements of alignment.

e. Preparation of clearing design for project.

f. Determination of specific situations which may require mitigation, and of appropriate related mitigation measures.

All social and environmental issues will be addressed in the EPC application to the extent possible, and where not possible, the proposed process for addressing them will be identified.

Ancillary Applications

If the project is approved, the following approvals, permits and licenses which may be required under Federal, Provincial and Municipal law will be necessary:

1) Those required for construction work and camp operations under the Waste Management Act and the Water Act.

2) Special case authorizations under the Agricultural Land Commission Act.

3) Authorizations or acquisitions as required by the Land Act.

4) Licenses to cut under the Forest Act.

5) Permits for crossing pipelines and railroads.

6) Permits as required by the Navigable Waters Protection Act.

7) Approvals, permits and licenses routinely required from time to time for construction work and camp operation eg. Fisheries Act (Canada).

BC hydro

Kelly Lake — Cheekye Transmission Line Project

OPEN HOUSES

PHASE 1

B.C. Hydro is currently studying a second 500 kV transmission line from Kelly Lake Substation near Clinton to Cheekye Substation near Squamish, B.C.

We would like to invite you to drop by and review project information at an Open House. Project representatives from B.C. Hydro will be available to answer your questions. Light refreshments will be served. We encourage your participation in this project and appreciate your continued interest. The Open Houses will be held from 3 to 9 p.m. in the following locations:

Tues., Oct 3rd	**●Clinton Community Hall, Clinton**
Wed., Oct 4th	**●Bridge River School, Seton/Shalalth**
Thurs., Oct 5th	**●Recreation Centre, Lillooet**
Wed., Oct 11th	**●Municipal Hall, Pemberton**
Thurs., Oct 12th	**●Blackwater Creek Elem. School, Birken**
Fri., Oct 13th	**●Brackendale Art Gallery, Squamish**
Sat., Oct 14th	**●Myrtle Philip Elementary School, Whistler**

Kelly Lake – Cheekye Transmission Line Project

Phase 2 – Open Houses

BC Hydro is continuing to study a second 500 kV transmission line from Kelly Lake Substation near Clinton to Cheekye Substation near Squamish, B.C.

We would like to invite you to drop by and review updated project information at an Open House. Project representatives from BC Hydro will again be available to answer your questions. Light refreshments will be served. We encourage your participation in this project and appreciate your continued interest. The Open Houses will be held from 4 to 8 p.m. in the following locations:

Mon	**June 4**	**•Brackendale Art Gallery** **Government Road, Squamish**
Tues	**June 5**	**•Birkenhead Lodge** **Portage Road, Birken**
Wed	**June 6**	**•Conference Centre** **Whistler Way, Whistler**
Thurs	**June 7**	**•Pemberton Sr. Sec. School** **Pemberton Meadows Road, Pemberton**
Mon	**June 11**	**•Clinton Community Hall** **306 LaBourdais Avenue, Clinton**
Tues	**June 12**	**•Bridge River School** **Mission Mountain Road, Seton Portage/Shalalth**
Wed	**June 13**	**•Legion Hall** **737 Main Street, Lillooet**

WELCOME!

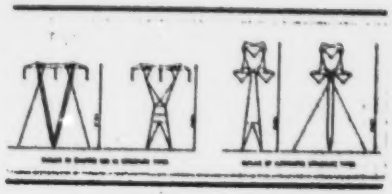
WHY AN OPEN HOUSE?

- TO PROVIDE YOU WITH INFORMATION ABOUT THE KELLY LAKE - CHEEKYE TRANSMISSION LINE
- TO RECEIVE FEEDBACK FROM YOU ABOUT YOUR CONCERNS
- TO ENCOURAGE CONSULTATION WITH INTERESTED PUBLICS

BC hydro

WHAT IS THE PROJECT ABOUT?

- HYDRO STUDYING NEW SINGLE CIRCUIT 500 kV TRANSMISSION LINE FROM KELLY LAKE TO CHEEKYE
- ROUTE NOT YET SELECTED
- TOWERS SIMILAR TO ONE OR MORE DESIGNS SHOWN BELOW

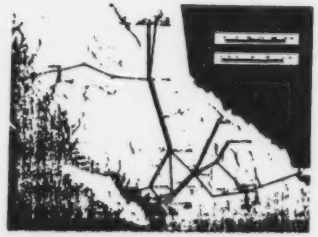


500 kV TRANSMISSION LINE PROJECT STRUCTURE TYPES

WHY IS THE PROJECT BEING STUDIED?

- INTERIOR TO LOWER MAINLAND SYSTEM NEEDS REINFORCING TO SUPPORT INCREASED LOADS AND AVOID WIDESPREAD POWER OUTAGES
- ELECTRICITY DEMAND GROWING — 70% OF ELECTRICAL DEMAND ON HYDRO SYSTEM LOCATED IN LOWER MAINLAND AND ON VANCOUVER ISLAND
- HYDRO REDUCING ELECTRICITY DEMAND THROUGH CONSERVATION PROGRAMS SUCH AS POWER SMART (PAMPHLETS AVAILABLE HERE)
- NEW PROJECTS BUILT ONLY WHEN LESS COSTLY ALTERNATIVES EXHAUSTED
- DEMAND FOR ELECTRICITY EXCEEDED HYDRO'S PROJECTIONS EACH OF LAST THREE YEARS

TRANSMISSION ADDITIONS TO YEAR 2000



SVCs - STATIC VAR COMPENSATORS - DEVICES USED TO CONTROL POWER SYSTEM VOLTAGES

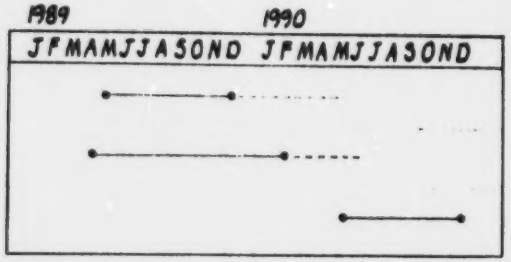
BPA - BONNEVILLE POWER ADMINISTRATION

WWP - WASHINGTON WATER POWER

PSPL - PUGET SOUND POWER AND LIGHT

TIMING

ACTIVE ⟷ ONGOING ···



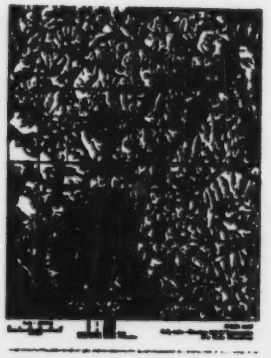
MAY 1989 TO DECEMBER 1989 –
ENVIRONMENTAL AND TECHNICAL STUDIES

APRIL 1989 TO FEBRUARY 1990 –
PUBLIC CONSULTATION

1990 –
REGULATORY REVIEW

IF PROJECT APPROVED WOULD TAKE 5-5½ YEARS –
SURVEYING, CLEARING AND CONSTRUCTION

TRANSMISSION LINE ROUTE ALTERNATIVES



TECHNICAL ROUTE STUDIES

TECHNICAL (ENGINEERING) STUDIES WILL EXAMINE:

- TECHNICAL FEASIBILITY AND LINE SECURITY LIMITED BY TERRAIN, EXPOSURE, CLIMATIC CONDITIONS AND POTENTIAL HAZARDS (AVALANCHE, EROSION)
- COSTS RELATED TO ENGINEERING DESIGN, RIGHT-OF-WAY ACQUISITION, CLEARING, CONSTRUCTION AND OPERATION

STRUCTURE FAILURE AT RUTHERFORD CREEK IN 1980

STRUCTURE FAILURE RESULTING FROM AVALANCHE

Environmental Studies

Environmental studies will examine:

- Forestry and vegetation
- Wildlife
- Terrain, soils and agriculture
- Fisheries and water use
- Socio-economics and land use
- Heritage resources
- Visual and recreation resources

Preliminary Environmental Highlights

Map 1 - Kelly Lake to Pemberton

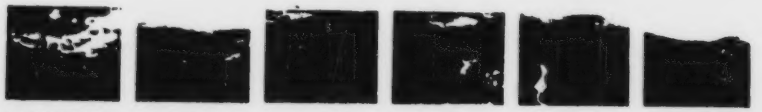
Pavilion - Agriculture; social; wildlife and visual

Antoine - Wilderness; hunting/wildlife; terrain and visual

Mission - Terrain and alpine vegetation

Anderson - Water supplies; food/berry crops, wildlife and terrain

Duffy - Visual; tourism/recreation, terrain and forestry



Duffy Lake viewed from the north | Seton Portage and Mission Ridge | Fraser River at Haylmen looking north | Confluence of the Bridge River and Fraser | Lillooet | Existing 500 kV line (Mica) ascending Mission Ridge

Preliminary Environmental Highlights

Map 2 - Anderson to Daisy Lake

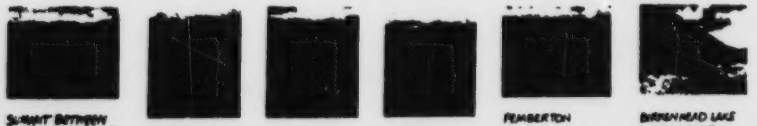
Birkenhead - Agriculture; visual, recreation and wilderness

Gates - Land use; social; water supplies; visual and EMF

Pemberton - Social; EMF; visual; agriculture and land use

Ryan - Visual; recreation; alpine vegetation and wilderness

500 - Wildlife; forestry and tourism/recreation



Summit between Ferguson Creek & Pemberton Valley | Anderson Lake (Daisy) viewed from the south | Birken Valley & Gates Lake viewed from the north | Summit area in vicinity of Owl Lake | Pemberton | Birkenhead Lake looking south

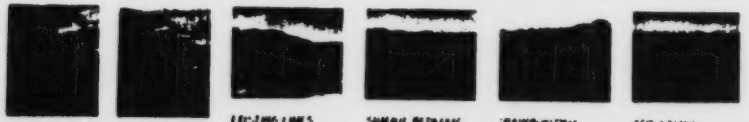
Preliminary Environmental Highlights

Map 3 - Pemberton to Cheekye

Rainbow - Alpine wilderness; forestry; visual and wildlife

Whistler - Visual, social; EMF; recreation and land use

Cheakamus - Visual; recreation; water quality; wildlife; social and land use



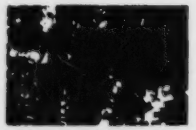
Whistler, Alpine in foreground, Green Lake in background looking north | Whistler area looking north | Existing lines viewed from Alta Lake | Summit between Mt. Fee and Powerline Creeks | Pemberton looking north | Soo Valley looking east

Some Questions Raised By The Public

- PERCEIVED HEALTH RISKS FROM ELECTRIC AND MAGNETIC FIELDS (EMFs)
- VEGETATION MANAGEMENT ON RIGHTS-OF-WAY
- NEED FOR THE PROJECT
- INTRUSION INTO WILDERNESS AREAS
- VISUAL IMPACTS
- IMPACTS ON PROPERTY VALUE
- LAND USE AND PROPERTY ISSUES, INCLUDING NATIVE LANDS
- DISTURBANCE OF WETLANDS, WATER SOURCES, AND TERRAIN

Vegetation Management

CHRISTMAS TREE FARM IN THE RIGHT OF WAY



CUT STUMP TREATMENT EXAMPLE OF SELECTIVE HERBICIDE APPLICATION

- TALL, FAST GROWING SPECIES (eg RED ALDER, COTTONWOOD) MUST BE CONTROLLED ALONG RIGHTS-OF-WAY
- HYDRO USES 3 BASIC TECHNIQUES:

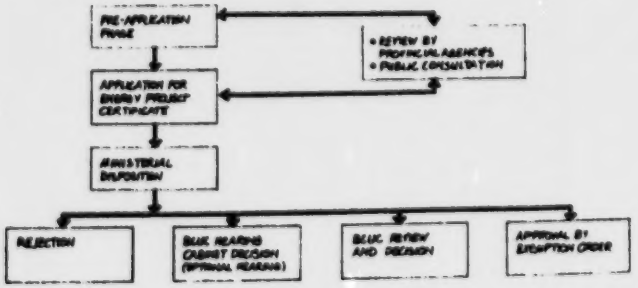
  BIOLOGICAL CONTROL - ENCOURAGING COMPETING PLANTS

  CHEMICAL CONTROL - SPECIES AND SITE SPECIFIC HERBICIDE APPLICATION

  PHYSICAL CONTROL - MANUAL OR MECHANICAL CUTTING

How Will This Project Be Reviewed?

- THIS PROJECT SUBJECT TO REGULATORY REVIEW UNDER BC. UTILITIES COMMISSION ACT
- APPLICATION SUBMITTED TO MINISTER OF ENERGY, MINES AND PETROLEUM RESOURCES; ALSO REVIEWED BY MINISTER OF ENVIRONMENT
- OPPORTUNITIES FOR PUBLIC INPUT: CONSULTATION PROGRAM AND HEARING DEPENDING ON DISPOSITION (SEE BELOW)



Thank You

BC HYDRO APPRECIATES YOUR ATTENDANCE AT THIS OPEN HOUSE AND ENCOURAGES YOUR CONTINUED INVOLVEMENT. WE WILL KEEP YOU INFORMED ABOUT THIS STUDY AND WELCOME YOUR INPUT. PLEASE COMPLETE THE EXIT SURVEY ON YOUR WAY OUT.

KELLY LAKE/CHEEKYE

WELCOME TO OUR OPEN HOUSE

ON

B.C. HYDRO'S STUDIES

FOR THE PROPOSED

KELLY LAKE – CHEEKYE

500 kV TRANSMISSION LINE PROJECT

JUNE 1990

BC hydro

proud of our Service

KELLY LAKE/CHEEKYE

YOUR INPUT IS IMPORTANT!

Issues already raised by the public include:

- Need for the project
- Potential risk from electric and magnetic fields
- Right-of-way and vegetation management
- Land use and property issues
- Environmental impacts, e.g:
  - wilderness areas
  - fisheries and wildlife
  - visual
- Electricity trade
- Local benefits

KELLY LAKE/CHEEKYE

VEGETATION MANAGEMENT

- [illegible]
- [illegible]
- BIOLOGICAL CONTROL [illegible]
- CHEMICAL CONTROL [illegible]
- PHYSICAL CONTROL [illegible]

KELLY LAKE/CHEEKYE

FUTURE ACTIVITIES

Public Consultation

- Respond to second phase of consultation.
- Ongoing consultation to refine route options and alignments within corridors.
- Further consultation and updates as required.

Regulatory Requirements

- Application to construct project is planned to be submitted to Ministry of Energy, Mines and Petroleum Resources in Fall 1990.
- Scheduled for reviews and regulatory decision in early 1991.

Design and Construction

- If project approved construction would take 5-5½ years.
- Negotiations with affected landowners will begin after project approval.
- Consultation would continue through construction. Monitoring will ensure line is built to specifications.

KELLY LAKE/CHEEKYE

Thank you for your participation and comments.

Please complete the comment form on your way out.

We look forward to your continued involvement.

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KELLY LAKE/CHEEKYE

WHY AN OPEN HOUSE?

- To review results of environmental/technical studies and public consultation to date.
- To present and review routing generally agreed on during Phase I.
- To further discuss areas where there is no route consensus.

KELLY LAKE/CHEEKYE

WHAT IS THE PROJECT UNDER STUDY?

- A 500 kV transmission line approximately 200 km in length.
- Connects existing Kelly Lake Substation near Clinton to existing Cheekye Substation near Squamish.
- Depending on route selected, could involve replacement of an existing transmission line from Shalalth to Cheekye.

Proposed Alternative Routes

A

B

KELLY LAKE/CHEEKYE

WHY IS THE PROJECT BEING STUDIED?

- Interior to Lower Mainland transmission system needs reinforcing to support increases in the demand for electricity and to continue to provide reliable service
- Demand for electricity is growing – 70% of the demand for electricity in the Hydro system is located in the Lower Mainland and Vancouver Island.
- Energy conservation programs such as Power Smart offset some of that growth.
- Growth in demand for electricity exceeded Hydro's projections for each of the last 3 years.
- The last 500 kV line to the Lower Mainland was built almost 15 years ago.

KELLY LAKE/CHEEKYE

Progress To Date

SPRING 1989	• Study Announcement • Technical and Environmental Route Studies Initiated • Public Consultation Initiated • Municipal Councils, Regional District Briefings
FALL 1989	• Public Distribution of First Newsletter • Eight Public Open Houses
FALL/SPRING 1989/90	• Internal Review of Public Input and Technical and Environmental Findings • Ongoing Consultation with Government, Interest Groups and Native Bands/Tribal Councils

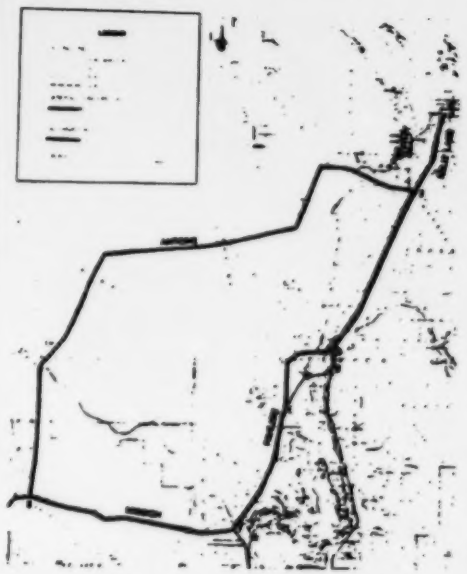
KELLY LAKE/CHEEKYE

ANTOINE ROUTE VS EXISTING PAVILION/ MISSION SEGMENTS

TECHNICAL	• [illegible]	• [illegible]
ENVIRONMENTAL	• [illegible]	• [illegible]
VISUAL	• [illegible]	• [illegible]
SOCIAL	• [illegible]	• [illegible]

KELLY LAKE/CHEEKYE

ANTOINE ROUTE VS EXISTING PAVILION/ MISSION SEGMENTS



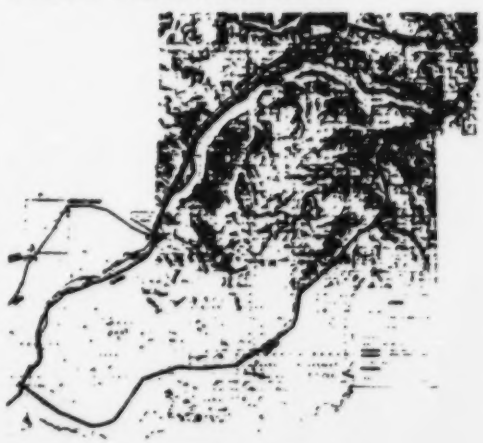
KELLY LAKE/CHEEKYE

DUFFEY SEGMENT VS EXISTING MISSION ANDERSON/GATES SEGMENTS

		GATES
TECHNICAL	• [illegible]	• [illegible]
ENVIRONMENTAL	• [illegible]	• [illegible]
VISUAL	• [illegible]	• [illegible]
SOCIAL	• [illegible]	• [illegible]

KELLY LAKE/CHEEKYE

DUFFEY SEGMENT VS EXISTING MISSION/ANDERSON/GATES SEGMENTS



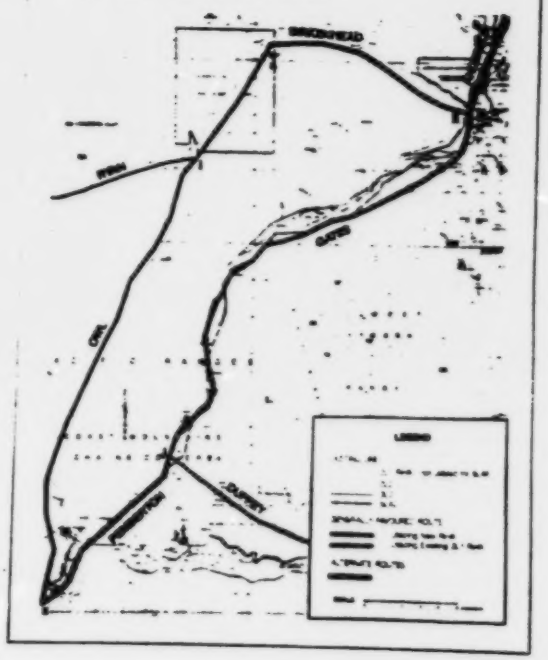
KELLY LAKE/CHEEKYE

BIRKENHEAD/OWL SEGMENTS VS GATES/PEMBERTON SEGMENTS

	[redacted]	[redacted] (Existing)
TECHNICAL	• construction is difficult • cost (higher)	• uses existing access
ENVIRONMENTAL	• disturbance of wildlife	• less impact
VISUAL	• high visual impact • significant impact on Berkenhead Lake Park and Mt. Remayne recreation area	• less visual impact although high impact on hill west of Pemberton
SOCIAL	• requires crossing of Pemberton watershed	• concern about property and land use impacts • Electric and Magnetic Field effects • proximity to communities at Birken, Gates and Pemberton

KELLY LAKE/CHEEKYE

BIRKENHEAD OWL SEGMENTS VS GATES PEMBERTON SEGMENTS



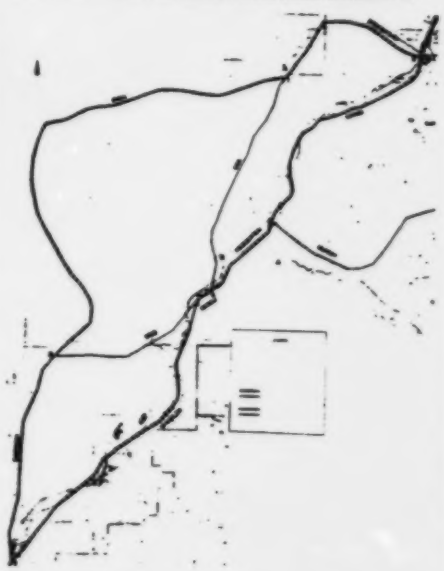
KELLY LAKE/CHEEKYE

BIRKENHEAD/RYAN/RAINBOW SEGMENTS VS GATES/PEMBERTON/GREEN/WHISTLER SEGMENTS

	[redacted]	[redacted] (Existing)
TECHNICAL	• construction is difficult • [redacted] • maintenance concerns • cost (higher)	• uses existing access roads
ENVIRONMENTAL	• potential impacts on mountain goats and grizzly bears	• less impact
VISUAL	• significant impacts on Berkenhead Lake Park and proposed Mt. Remayne recreation area	• fewer impacts • visibility at Whistler
SOCIAL	• represents the greatest intrusion into wilderness areas of any option • traverses an area of considerable future recreation interest	• less impact • no concession exists for routing through Whistler

KELLY LAKE/CHEEKYE

BIRKENHEAD/RYAN/RAINBOW SEGMENTS VS GATES/PEMBERTON/GREEN/WHISTLER SEGMENTS



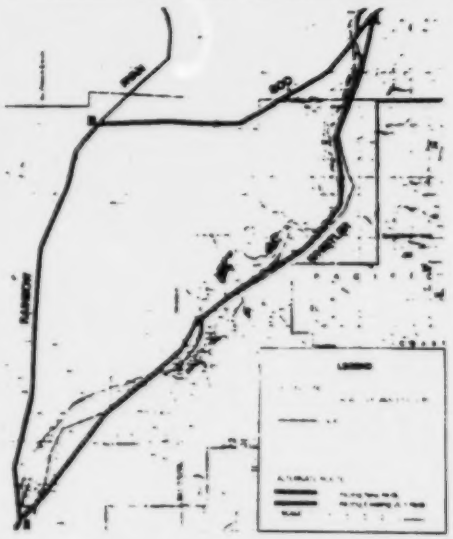
KELLY LAKE/CHEEKYE

SOO/RAINBOW VS EXISTING WHISTLER SEGMENT

		(Existing)
TECHNICAL	• steep walls with some avalanche prone terrain • construction difficult • road higher	• uses existing access roads
ENVIRONMENTAL	• disruption of wildlife in Soo River wetlands • historic recreation potential	• temporary disruption during construction
VISUAL	• transmission line across Whistler and Highway 99 routing • impact on pristine areas of Callaghan Valley and mountain pass area of Rainbow Mountain	• environmental impacts where many existing corridor
SOCIAL	• impact on recreational land in Soo and Callaghan Valleys	• less connection or routing through Whistler

KELLY LAKE/CHEEKYE

SOO/RAINBOW VS EXISTING WHISTLER SEGMENT



KELLY LAKE/CHEEKYE

LOWER CHEAKAMUS SUB-OPTIONS VS EXISTING ROUTE

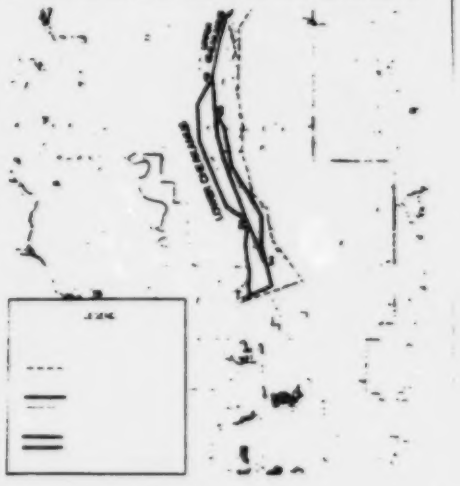
TECHNICAL	•	•
ENVIRONMENTAL	•	•
VISUAL	•	•
SOCIAL	•	•

TECHNICAL	•	•
ENVIRONMENTAL	•	•
VISUAL	•	•
SOCIAL	•	•

TECHNICAL	•	•
ENVIRONMENTAL	•	•
VISUAL	•	•
SOCIAL	•	•

KELLY LAKE/CHEEKYE

LOWER CHEAKAMUS SUB-OPTIONS VS EXISTING ROUTE



PROPOSED KELLY LAKE TO CHEEKYE TRANSMISSION LINE

OPEN HOUSE
_____Place____ , ____Date____

Please fill out this form and leave it with us.

Name (if you wish) _____ Phone _____
Address _____ Postal Code _____
Affiliation _____

Would you like to be on our mailing list for future information regarding this project? Yes _____ No _____

- Several alternative routes are being studied for the Kelly Lake - Cheekye line. Do you have comments about any of these routes?

_____
_____
_____
_____
_____
_____
_____

- What are your general comments on the proposed Kelly Lake to Cheekye project.

_____
_____
_____
_____
_____
_____
_____

Please see reverse.

- What resource information (e.g., locations of traplines, wells, historical sites) do you have that would be useful to evaluating different route options?

- Do you have any suggestions about the public consultation program conducted to date for this project?

- Is there anything else you would like to add?

- Could B.C. Hydro contact you to discuss any questions they may have?
  Yes_____ No_____
  (If yes, please be sure your name and address are shown on the first page).

BCHydro

Kelly Lake - Cheekye Transmission Line

"Let's Hear your Comments"

Name _____

Has your name been added to our mailing list for Kelly Lake - Cheekye? YES _____ NO _____

If you'd like to be included on the mailing list, please sign the sheet at the entrance to the Open-House.

What is your route preference for the section of the line in or near your community?

_____

_____

Why do you prefer this route?

_____

_____

What are your primary concerns about the Kelly Lake - Cheekye transmission line?

_____

_____

What items would you like us to follow up on?

_____

_____

Do you have any comments on our public consultation process or the Open House?

_____

_____

Do you have any additional comments?

_____

_____

Thanks for taking the time to complete this survey.
Your opinions matter to us.

Location: Brackendale **Date: June 4**

Summary Results from Exit Surveys
Kelly Lake-Cheekye: Open Houses – Phase 1

	Squamish	Pemberton	Seton/ Shalalth	Birken	Whistler	Lillooet	Clinton	Seton Band	Total
Routing Issues	11	2	3	5	5	7	4	3	40
Environmental Impacts	1	1	1	1	4	1	1	1	11
EMF Health Effects	1	1	0	0	1	3	2	1	9
Consultation Process	7	1	2	2	5	4	2	2	25
Visual Impacts	0	0	0	2	2	1	0	1	6
Native Issues	1	1	0	0	0	2	0	2	6
Vegetation	1	0	0	0	0	3	0	1	5

Summary Results from Exit Surveys
Kelly Lake-Cheekye Open Houses Phase 2

Route Preference	Squamish	Pemberton	Seton/ Shalalth	Birken	Whistler	Total
Generally Favored Route	3	14	3	8	3	31
High Eastern Option (east of Daisy Lake)	34				2	36
Ryan		1				1
Birkenhead		1		1		2
Duffey				5		5
Hurley Valley				2		2
Rainbow					2	2
Primary Concerns						
EMF Health Effects	19	2		4	3	28
Environmental Impacts	13	3	2		2	20
Property Issues	10	1		5	1	17
Visual Effects	13	1		3	5	22
Routing	5	6		4		15
Future Impacts *		2		2	1	5

Note: No exit surveys were completed in Clinton

* Includes concerns re: proximity of line to future development areas; future location of lines etc.

Information Centres

Community	Municipal Hall	Library
1. Squamish	Box 310 Squamish, B.C. V0N 3G0 Ph. 892-5217	Box 1039 Squamish, B.C. V0N 3G0 Ph. 892-3110
2. Whistler	Box 35 Whistler, B.C. V0N 1B0 Ph. 932-5535	Box 824 Whistler, B.C. V0N 1B0 Ph. 932-5564
3. Pemberton	Box 100 Pemberton, B.C. V0N 2L0 Ph. 894-6135	Box 430 Pemberton, B.C. V0N 2L0 Ph. 894-6916
4. Gold Bridge		(in school) General Delivery Gold Bridge, B.C. V0K 1P0 Ph. 238-2255
5. Birken	Mr. & Mrs. Watson Birkenhead Resort P.O. Box 369 Pemberton B.C. V0N 2L0 Ph. 452-3255	

Community	Municipal Hall	Library
6. Seton Portage/ Shalath		Edith Lovey General Delivery Seton Portage V0N 3B0
7. Lillooet	Box 610 Lillooet, B.C. V0K 1V0 Ph. 256-4289	Box 939 Lillooet, B.C. V0K 1V0 Ph. 256-7047
8. Clinton	Box 309 Clinton, B.C. V0K 1K0 Ph. 459-2514	Box 550 Clinton, B.C. V0K 1K0 Ph. 459-7752
9. Cache Creek	Box 7 Cache Creek, B.C. V0K 1H0 Ph. 457-6237	Box 429 Cache Creek, B.C. V0K 1H0 Ph. 457-9953

VOLUME ONE

B. PUBLIC INFORMATION MATERIALS

11. List of Information Sheets

Electric and Magnetic Fields: Are there biological effects?

The Energy Project Review Process

Environmental & Technical Studies

Long Range Planning

PCB Storage and Disposal

Power Smart

Project Planning-Electric

Land Acquisition Practices

Public Consultation Process

Electricity Plan

Vegetation Management in Transmission Line Corridors

Independent Power Producers

Volume

2

synergistics

Kelly Lake to Cheekye Substation
Second 500 kV Transmission Line

Public Consultation Report
Phases 1 & 2

Appendices - Volume II

Submitted to:
B.C. Hydro
April 1991

Canadian Cataloguing in Publication Data
Synergistics Consulting Limited
Kelly Lake to Cheekye Substation second 500 kV transmission line public consultation report phases 1 & 2

Contents: [v.3]. Appendices, vol.II
ISBN 0-7726-1333-8 (v.3)

1. Electric lines - British Columbia - Squamish-Lillooet - Public opinion. 2. Electric power transmission - British Columbia - Squamish-Lillooet-Public opinion. I. B.C. Hydro. II. Title.

TK3144.S96 1991 621.319'13 C91-092152-0

synergistics

Kelly Lake to Cheekye Substation
Second 500 kV Transmission Line

Public Consultation Report
Phases 1 & 2

Appendices - Volume II

Submitted to:
B.C. Hydro
April 1991

Synergistics Consulting Limited
Élaboration synergie limitée
TORONTO • OTTAWA • VANCOUVER

Suite 400-12 Water Street
Vancouver, B.C. V6B 1A5
Telephone (604) 684-7760
Fax (604) 681-3546

APPENDICES

VOLUME II

C. MEDIA MATERIALS
   1. Press Release
   2. Open House Ad Runs
   3. Media Advisory
   4. List of Media Contacts
   5. Newspaper Advertisements: Phase 1
   6. Newspaper and Radio Advertisements: Phase 2
   7. Newspaper Clippings

D. CHRONOLOGY
   1. Chronology of Meetings: Phases 1 and 2

E. CORRESPONDENCE
   1. Standard letters distributed: Phases 1 and 2
   2. Petitions Received and B.C. Hydro Responses
   3. Summary of Public Information Requests(PIRs): Phases 1 and 2
   4. List of Interest Groups Contacted by B.C. Hydro

BC hydro News

Communications
970 Burrard Street
Vancouver B.C. V6Z 1Y3

41/13/06/89

DATE: FOR IMMEDIATE RELEASE
CONTACT: PETER McMULLAN
(604) 663-2409

B.C. Hydro is ready to start a public consultation program in association with studies for a second 500 kilovolt (kV) transmission line between Kelly Lake substation, near Clinton, and Cheekye Substation, near Squamish.

This planning process has been initiated in response to recent forecasts which indicate growth in demand from the Lower Mainland and Vancouver Island will require reinforcement to the transmission system by the mid-1990's.

A route for the new transmission line will not be selected until Hydro has completed a full consultation process with affected landowners and communities. Once this stage has been reached Hydro will submit a formal application to the provincial government.

During the summer Hydro will carry out environmental and technical studies and will identify and examine a number of potential options. Details of these studies will be shared with various levels of provincial and municipal government and with interested members of the public.

Hydro understands the need to assess any impacts the line may have at an early stage and the public consultation program will be used to detail and address potential concerns. This program will continue throughout the project planning process.

- 30 -

Open House Ad Runs

Media	Ad Runs	
	Phase 1	Phase 2
Ashcroft-Cache Creek Journal	September 26/89	
Lillooet Bridge River News	Sept 27 & Oct 4/89	May 30 & Jun 6/90
100 Mile House Spectator		May 29 & Jun 5/90
Squamish Times	Oct 3 & Oct 11/89	May 23 & May 29/90
Whistler Question	October 5/89	May 24 & May 31/90
Whistler Citizen	Oct 5 & Oct 13/89	May 25 & May 31/90
Mountain FM Radio		May 28/90

BC hydro

proud of our Service

27 September 1989

MEDIA ADVISORY

FROM: Verne Prior
Corporate Communications
B.C. Hydro
Telephone: (604) 663-2409

Proposed 500 kV Transmission Line from Kelly Lake near Clinton to Cheekye near Squamish

In view of interest shown in the above mentioned project, we are sending you additional information for your records.

The enclosed material is being distributed to the public in the Kelly Lake-Cheekye region, as part of our public consultation program.

Should you require further assistance, please do not hesitate to contact us.

LIST OF MEDIA CONTACTS

Squamish Times
Box 220
Squamish, B.C.
V0N 3G0

Ashcroft-Cache Creek Journal/
Logan Lake Leader
404-4th Street
Ashcroft, B.C.
V0K 1A0

Kamloops This Week
11-319 Victoria Street
Kamloops, B.C.
V2C 2A3

Whistler Question
Box 126
Whistler, B.C.
V0N 1B0

The Sun
2250 Granville Street
Vancouver, B.C.
V6H 3G2

Whistler-Pemberton Citizen
Box 449
Squamish, B.C.
V0N 1V0

Kamloops Daily News
106-63 West Victoria Street
Kamloops, B.C.
V2C 6J6

Bridge River-Lillooet News
Box 709
979 Main Street
Lillooet, B.C.
V0K 1V0

The Province
2250 Granville Street
Vancouver, B.C.
V6H 3G2

Also in Pavilion Creek Runner Sept 26

BC hydro

KELLY LAKE-CHEEKYE TRANSMISSION LINE PROJECT

OPEN HOUSE

BC Hydro is currently studying a second 500 kV transmission line from Kelly Lake Substation near Clinton to Cheekye Substation near Squamish, B.C.

We would like to invite you to drop by and review project information at an Open House. Project representatives from BC Hydro will be available to answer your questions. Light refreshments will be served. We encourage your participation in this project and appreciate your continued interest.

The Open House will be held:

- Clinton Community Hall
- Tuesday, October 3
- 3:00 to 9:00 pm

BC hydro

KELLY LAKE-CHEEKYE TRANSMISSION LINE PROJECT

OPEN HOUSE

BC Hydro is currently studying a second 500 kV transmission line from Kelly Lake Substation near Clinton to Cheekye Substation near Squamish, B.C.

We would like to invite you to drop by and review project information at an Open House. Project representatives from BC Hydro will be available to answer your questions. Light refreshments will be served. We encourage your participation in this project and appreciate your continued interest.

The Open House will be held:

- Bridge River School, Seton/Shalalth
  Wednesday, October 4
  3:00 to 9:00 pm
- Recreation Centre, Lillooet
  Thursday, October 5
  3:00 to 9:00 pm

Also in Bridge River News Sept 27, '89

BC hydro

KELLY LAKE—CHEEKYE TRANSMISSION LINE PROJECT

OPEN HOUSE

BC Hydro is currently studying a second 500 kV transmission line from Kelly Lake Substation near Clinton to Cheekye Substation near Squamish, B.C.

We would like to invite you to drop by and review project information at an Open House. Project representatives from BC Hydro will be available to answer your questions. Light refreshments will be served. We encourage your participation in this project and appreciate your continued interest.

The Open House will be held:

- **Municipal Hall, Pemberton**
  Wednesday, October 11
  3:00 to 9:00 pm

- **Blackwater Creek Elementary School, Birken**
  Thursday, October 12
  3:00 to 9:00 pm

BC hydro

KELLY LAKE-CHEEKYE
TRANSMISSION LINE PROJECT

OPEN HOUSE

BC Hydro is currently studying a second 500 kV transmission line from Kelly Lake Substation near Clinton to Cheekye Substation near Squamish, B.C.
We would like to invite you to drop by and review project information at an Open House. Project representatives from BC Hydro will be available to answer your questions. Light refreshments will be served. We encourage your participation in this project and appreciate your continued interest.
The Open House will be held:

- Brackendale Art Gallery, Squamish
  Friday, October 13
  3:00 to 9:00 pm

B - Wednesday, October 11, 1989 - *The Squamish Times*

BC hydro

KELLY LAKE-CHEEKYE
TRANSMISSION LINE PROJECT

OPEN HOUSE

BC Hydro is currently studying a second 500 kV transmission line from Kelly Lake Substation near Clinton to Cheekye Substation near Squamish, B.C.
We would like to invite you to drop by and review project information at an Open House. Project representatives from BC Hydro will be available to answer your questions. Light refreshments will be served. We encourage your participation in this project and appreciate your continued interest.
The Open House will be held:

- Myrtle Philip Elementary School, Whistler
  Saturday, October 14
  3:00 to 9:00 pm

30 - Friday October 13, 1989 - The Citizen

You are invited

to an Open House to share updated information on the Kelly Lake to Cheekye transmission line project.

Last October, we held Open Houses to learn your thoughts and ideas on a proposed second 500 kV transmission line from Kelly Lake Substation near Clinton to Cheekye Substation near Squamish.

With your suggestions and the results of environmental and technical studies, we have refined the possible options. Now we'd like to share this information – and some light refreshments – with you, get your feedback and answer any questions.

Please plan to join us. We appreciate your interest and participation.

Open Houses will be held from 4 to 8 pm in all locations.

Date	Location	
Mon., June 4	Squamish	Brackendale Art Gallery Government Road
Tues., June 5	Birken	Birkenhead Lodge Portage Road
Wed., June 6	Whistler	Conference Centre Whistler Way
Thurs., June 7	Pemberton	Pemberton Sr. Sec. School Pemberton Meadows Road
Mon., June 11	Clinton	Clinton Community Hall 306 LaBourdais Avenue
Tues., June 12	Seton Portage/ Shalalth	Bridge River School Mission Mountain Road
Wed., June 13	Lillooet	Legion Hall 737 Main Street

BC hydro

B.C. Hydro
3 columns x 150 lines - 450 MALs
Prepared 90-05-16
Martha King Consulting Inc.
1330 Seymour Street
Vancouver, B.C. Canada, V6B 3P3
Telephone (604) 682-2251
Fax (604) 684-9518

Bridge River-Lillooet [illegible]
(Lillooet, B.C.)
JUN -7 1989

288

Hydro needs costly lines

Growing electricity demand in the Lower Mainland and on Vancouver Island means that BC Hydro must soon launch a multi-million dollar upgrading of its province-wide transmission system.

And some of those new transmission lines will be running through the Lillooet area.

Details of Hydro's projected additional transmission line requirements are outlined in its 1989 Twenty-year Resource Plan which was released May 31. According to the plan, Hydro's total expenditures for the next ten years, including generating and transmission projects, will approach $4 billion.

The plan calls for a 500 kV line to be built from [illegible] Lake substation near [illegible] Lo[illegible] substation by 1998 at a cost of $139 million. The 200-km. line would serve additional Lower Mainland and Vancouver Island load growth, which amounts to about 70 per cent of the total electrical demand on the province-wide Hydro system.

The plan also calls for a third 500-kilovolt line linking Williston Substation near Prince George and the Kelly Lake Substation.

"We'll have public consultations on these lines this summer and hope to have the applications ready to submit by year-end," said Chris Boatman, Hydro vice-president of corporate and environmental affairs.

All projects must be approved by provincial regulators.

Squamish (B.C.) Citizen
JUN 29 1989

B.C. Hydro proposes a 500 KV line through Whistler

288

Demand for Hydro power has increased by approximately three per cent per year in the Lower Mainland in the last several years, and has necessitated a search for a new 500 KV line.

One of the favored routes is one which will run 200 km directly through Whistler, from the Kelly Lake Substation to the Cheekeye Substation near Squamish.

Thom Thompson says the number of routes is limited in B.C. by topography and the number of people living here.

Other alternatives would cost more. A suggested underground line could be as much as ten times the cost of the overhead lines.

Whistler already has several existing hydro lines running around and through the area. The new line would replace an older, less powerful one.

Consultant Ann Svendsen said it has yet to be proven whether powerful hydro lines cause health defects or environmental damage. Before the lines go in, however, she says extensive environmental and technical studies will be carried out.

The project was originally suggested in the early 1980's, but was put on hold during the recession in 1984. It was re-activated as the power demand grew in the lower mainland. The time frame for the new line would be in two phases. Phase one would include planning and development, public consultation, and environmental studies.

Phase two would require approximately 5.5 years for surveying, design, clearing and construction.

Hydro officials say the new line is absolutely essential if the same level of power is to be maintained. Though Hydro has had a surplus of power over the last several years, that surplus is quickly being eroded by the increase in demand.

Whistler has experienced a ten per cent growth rate every year for ten years.

Their "powersmart" blitz, started several months ago, is designed to help consumers cut back on hydro use. Free hydro blankets were provided to Whistler residents and other B.C. residents in June to help cut back.

Whistler (B.C.) Question
JUN 29 1989

288

Hydro preparing for power line needed in 1990s

By Bob Barnett

B.C. Hydro is preparing municipalities between Lillooet and Cheekeye for a 500 kv power line that it says the Lower Mainland will require sometime in the late 1990s.

Representatives of Hydro appeared before the Squamish-Lillooet Regional District and the Resort Municipality of Whistler councils Monday to outline route options and justify the project.

Hydro's plans are to replace one of the 230 kv lines, dubbed 2L1, that currently runs the 200 km from the Kelly Lake substation through the Whistler Valley to the Cheekeye substation with a new 500 kv line. Three power lines run through the Whistler Valley at present, a 500 kv line built in 1970 and two 230 kv lines.

"We don't feel we have the option of not proposing the line."

Two "viable options" for the new 500 kv line exist, according to Ken Farquharson, an environmental consultant for Hydro. The first is for the new line to follow much of the existing right of way of the 2L1 line. The second is to divert the line west of Rainbow and Sproat Mountains and have it rejoin the other lines near the Daisy Lake dam. Hydro representatives put the cost of bypassing Whistler at an additional $5 million to $10 million on top of the $165 million estimated capital cost of the new line.

Further north, the new line could follow the existing right of way alongside Anderson Lake through Birken to Pemberton or it could follow the Duffey Lake Road to Pemberton.

Hydro officials told the Whistler council the new line will be necessary as Hydro's surplus of power has started to decline and the Lower Mainland and Vancouver Island at present consume about 70 per cent of Hydro's output. As well, the areas' demand for power is also growing faster than any other region in the province and it is expected to continue growing over the next 20 years.

"We don't feel we have the option of not proposing the line," Hydro's Billy Ellis told the Whistler council.

Ellis said the demand for power is related to economic growth and the B.C. economy is expected to grow at a rate of about three per cent annually over the next 10 years. He added that with the downturn in the economy in the early 1980s the demand for power decreased, which was partly responsible for a similar project being put on hold in 1984.

In addition to a predicted increase in demand for power Ellis said there is also a demand for more reliable power.

Thom Thompson told council Hydro is spending money on three programs to conserve energy and delay the need for a new 500 kv line as long as possible. The company is spending $250 billion on its Power Smart program over the next few years, upgrading its own

X See "HYDRO" pg.11

Whistler (B.C.) Question
JUL 29 1989

Hydro studying line's visual impact

Continued from page 1

system through its Resource Smart program and coordinating with other utilities, including Alcan Aluminum's Kemano project.

"We don't want to build this any earlier than we have to, it's too expensive," Ellis said.

The proposed 500 kv line is a single circuit line which would use towers similar to the present 500 kv line, with three sets of four conductors. The height of the towers would vary but the maximum height would be 130 feet. The line proposed in the early '80s was a double circuit line and would have required taller towers.

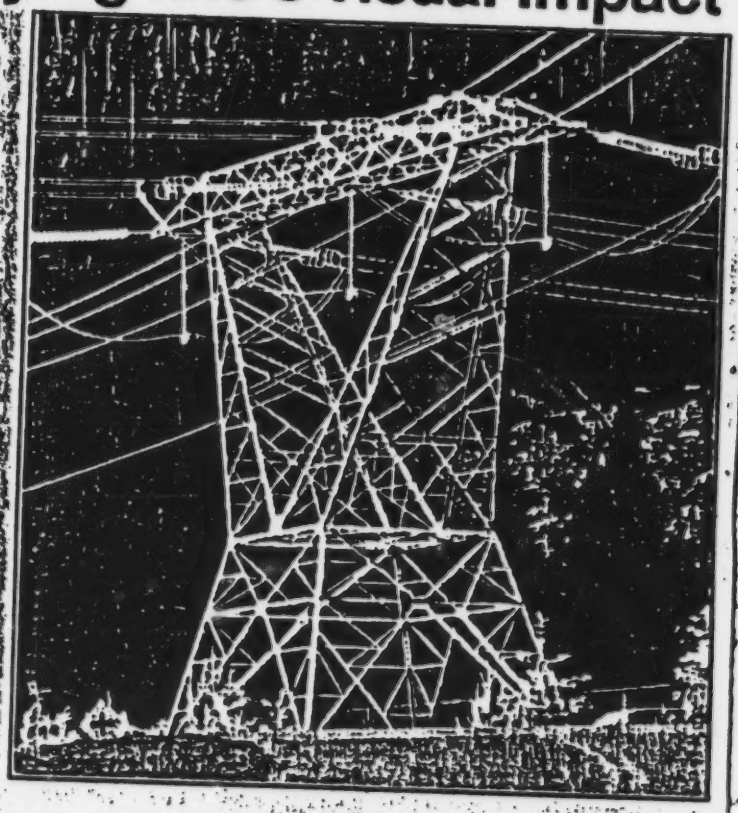
Hydro officials consider three lines to be the maximum the Whistler Valley could handle, and a fourth line is unlikely to ever be built.

Hydro is currently studying the visual impact of a new 500 kv line in the Whistler Valley using computer modelling, Farquharson said. The computer can show the effect of the line from different viewpoints in the valley.

If the 2L1 line is replaced the new 500 kv line wouldn't necessarily follow the exact route of the 2L1, but could be routed along one side of the valley, rather than down the centre.

"Whistler can get something out of this - a much improved approach from the south," Farquharson said.

Ald. Paul Burrows said SLRD board members had expressed the sentiment that the proposed 500 Kv line should go through the Whistler Valley rather than cutting new rights of way through the Duffey Lake area and around Sproat and Rainbow and "screwing up two more valleys."



Farquharson added "environmental aspects are proportional to the length of line."

Hydro's maps of B.C. show another line going from Kelly Lake down the Fraser Canyon to the Lower Mainland. The company hasn't ruled out an additional line through the canyon, however, Thompson said: "It's not a question of this versus that, we may need both."

He added that underground transmission lines cost about 10 times the price of conventional power lines and are not an option.

Hydro plans public consultation and participation programs in the coming months, as well as more detailed route studies.

The company hopes to submit an application to the B.C. Utilities Commission next year. The final decision to go ahead is made by the provincial government.

The second phase of development would require about five years for acquisition of rights of way, surveying, clearing, design and construction.

2 of 2

The Echo (Chetwynd, B.C.)

JUL -4. 1989

BC Hydro toll-free public inquiries

288

BC Hydro has established a toll free telephone number, 1-800-663-1377 to handle public inquiries and information requests relating to the proposed Kelly Lake — Cheekye 500 kV transmissin line, and other future transmission and generation projects. The introduction of the toll free line reflects Hydro's commitment to improved communications with the public, regardless of the caller's place of residence.

The toll free number will also be available to the public after office hours when project-related requests will be recorded on Hydro's answering system for later response by external relations staff.

Local information requests will also be handled by staff at Hydro's district and production offices in the vicinity of proposed projects.

Project information packages will be distributed from local district and production offices, and external relations and information services at head office, in Vancouver.

Mailing lists for each project will be developed to provide ongoing communication with interested groups, agencies and individuals throughout the public consultation process.

Ashcroft - Cache Creek (B.C.) Journal

JUL -4, 1989

288

Public consultation process for new Kelly Lake line

B.C. Hydro is ready to start a public consultation program in association with studies for a second 500-kilovolt (kV) transmission line between [redacted] substation near Clinton, and [redacted] station, near Squamish.

This planning process has been initiated in response to recent forecasts which indicate growth in demand from the Lower Mainland and Vancouver Island will require reinforcement to the transmission system by the mid-1990s.

A route for the new transmission line will not be selected until Hydro has completed a full consultation process with affected landowners and communities. Once this stage has been reached, Hydro will submit a formal application to the provincial government.

During the summer, Hydro will carry out environmental and technical studies and will identify and examine a number of potential options. Details of these studies will be shared with various levels of provincial and municipal government and with interested members of the public.

Hydro understands the need to assess any impacts the line may have at any early stage, and the public consultation program will be used to detail and address potential concerns. This program will continue throughout the project planning process.

Ashcroft - Cache Creek
(B.C.) Journal
JUL -4. 1989

Info hotline

288

Kelly Lake hydro questions answered

B.C. Hydro has established a toll-free telephone number -- 1-800-663-1377 -- to handle public inquiries and information requests relating to the proposed Kelly Lake - Cheekye 500 kilovolt transmission line, and other future transmission and generation projects. The introduction of the toll-free line reflects Hydro's commitment to improved communications with the public, regardless of the caller's place of residence.

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Council Briefs

Village opposes power lines along Duffey Lake Road

Bridge River Lillooet News

July 12 '89

The Village Council says BC Hydro shouldn't even consider putting its 500 kilovolt, 200 kilometre Kelly Lake-Cheekye transmission line along the Duffey Lake Road

The matter came up for discussion at the July 3 council meeting when council received a report from Village Clerk Bob Watson. He recommended, "BC Hydro be advised this community is totally opposed" to a transmission line along Duffey Lake.

Alderman Sheila McLean suggested the Village should urge Hydro to use existing power line corridors. And Mayor Joyce Harder said the sentiment at a recent Squamish-Lillooet Regional District meeting could best be summed up by the comment to Hydro: "You're not going to go in and spoil any other valleys."

•••

As part of its Power Smart program, BC Hydro is offering each BC municipality a free walk-through energy audit of one of its public buildings. The REC Centre will be the designated building in Lillooet.

•••

BRIDGE. AUG

A hastily arranged meeting was held locally Sunday evening, for anyone wishing to meet with MLA Jim Rabbitt. Jim and wife Eileen were in attendance at Gold Bridge Daze celebrations held over the weekend. They graciously no doubt shared some of their precious free time on a holiday weekend to drive out of their way to visit our area. Representatives from local Chamber of Commerce and BC Hydro were present to discuss local or regional issues. It developed that the subject to receive prior consideration was the "Highline" or Douglas Trail route between Seton Portage and D'Arcy along the northwest shore of Anderson Lake. Mr. Rabbitt appeared impressed with reports on

continuing efforts to maintain and upgrade this route, by the very limited resources of local residents. Also the interest shown by non-residents and travellers by contributing unsolicited funds to assist this program. This was highlighted by an unsolicited cheque for $200 from a North Vancouver resident who had travelled the route. The Info Centre and its record of visitors to this area in one month also seemed to impress Mr. Rabbitt.

Peace River Block News-Regional Weekly (Dawson Creek, B.C.)

AUG 28. 1989

B.C. HYDRO 299

To meet demands for electricity in the Vancouver area in the 1990s, B.C. Hydro has started consultations with municipalities on a route for a second 500 kilovolt transmission line from Kelly Lake substation near Clinton south of 100 Mile House to the Cheekye substation in Squamish.

Prince George (B.C.) Citizen

AUG 30 1989

POWER LINE CONCERNS ADDRESSED

by MALCOLM CURTIS
Staff reporter

B.C. Hydro has set up a toll-free telephone number to handle inquiries and possible health concerns about its proposed new high-voltage power line from Prince George to Clinton.

The utility officially confirmed Tuesday its plans for the 330-kilometre, 500-kilovolt line to carry power from Alcan's Kemano completion project to the Lower Mainland by 1994.

Residents on Vancouver Island protested about health hazards from electrical transmission wires and tried to block a 230-kilovolt line to a pulp mill in Gold River, B.C.

Dave Read, Hydro's community relations co-ordinator, said a hearing in Courtenay concluded health risks are "not substantiated" by research and the Vancouver Island line is now in operation.

"But we are providing information so people can make up their own minds," Read said Tuesday.

The line is to parallel Highway 97, starting from Prince George east of the highway, crossing it at several points, and running west of the highway south of Williams Lake, he said.

Hydro is making studies of the issue available at libraries in Prince George and other communities [illegible] Read said.

"One of the complaints we heard on Vancouver Island when people went to look for information was that there were no sources of information on the subject."

Canadian Press has reported a 1982 study published in the New England Journal of Medicine showed power station operators had 2½ times the death rate from all types of cancer. Researchers, however, generally believe more work is needed before reaching concrete conclusions.

Hydro believes the $170-million line (up from previous estimates of $130 million) won't have any serious impact.

Read noted that it will be built alongside two existing 500-kilovolt and one 230-kilovolt line following a right-of-way that avoids heavily settled areas.

"In terms of the people who live close to it, there are really very few."

Animal grazing is the primary use of land affected by the new power line, he said.

Hydro is meeting next month with interest groups like the B.C. Cattlemen's Association, the B.C. Wildlife Federation, community associations, Indian bands, and landowners to discuss the project.

As well, it is planning public meetings in the next two months, although a schedule hasn't been finalized.

The Crown utility is submitting an application soon to the Ministry of Mines and Petroleum Resources for an Energy Project certificate.

If the application is approved, Hydro plans to re-survey the required right-of-way next year.

The line was originally included as part of the Site C project on the Peace River in 1981 but was postponed because of declining electrical demands.

Read said it will be able to handle power both from Alcan's Kemano expansion project and from Site C.

See POWER LINE, page 3

Power line

FROM PAGE 1

"The line is required for a couple of reasons," he said.

"Lower Mainland load has increased to the point where we need a reliable supply and it's also justified on the basis of the greater efficiency of having three lines (carrying electricity south.)"

Kemano produces power from a reservoir created by the damming of the Nechako River, west of Prince George, for Alcan's aluminum smelter in Kitimat.

Alcan's $600-million expansion will produce electricity ahead of its Kitimat smelter expansion needs and the company has signed a 30-year agreement to provide the surplus energy to Hydro. The agreement can be cancelled after 10 years if Alcan decides to expand its smelter, Read said.

Site C, meanwhile, could come on stream within 10 years.

Read said the schedule calls for brush to be cleared for the new transmission line in 1991, with tower foundations installed in 1992, pylons erected the following year and the stringing of wires in 1994.

The line will link substations at Williston near Prince George and Kelly Lake near Clinton.

Another transmission line from Kelly Lake to the Cheekeye substation is slated to be completed in 1995 for power distribution to the Lower Mainland and Vancouver Island.

Hydro's toll-free number for further information is 1-800-663-1277

AUG. 30. 1989

BC UPDATE

A synopsis of current news items compiled by the Government of British Columbia.

Communications: B.C. Transit and Mobile Dat[illegible] International of Richmon[illegible] have signed a $5.5 millio[illegible] contract for installation of[illegible] computer based voice an[illegible] data communications sy[illegible] tems to be installed on [illegible] 800 Vancouver regi[illegible] buses within the next tw[illegible] years.

Forests: Up to 30 short term jobs are being created in the Quesnel area through a forestry project supported by a $395,486 government grant.

The project, one of a number under the government's $5 million community forestry program, involves brush-clearing, tree thinning and pruning more than 800 hectares and work on the 170 kilometre Alexander MacKenzie Heritage Trail.

The province pays up to 75 per cent the cost of projects under the program with the local government providing the rest.

Fisheries: The potential impact of aquaculture on B.C.'s fisheries resources is being studied under a $484,000 federal provin-[illegible]

B.C. Hydro: To meet the demands for electricity in the Vancouver area in the 1990's, B.C. Hydro has started consultations with municipalities on a route for a second 500 kilovolt transmission line from Kelly Lake substation near Clinton south of 100 Mile House to the Cheekye substation in Squamish, B.C.

[illegible]

Mining: A new mine scheduled to open in late 1992 at Mount Milligan near Mackenzie will create about 400 permanent jobs, 50 mroe than originally forecast.

Continental Gold Corp., which has a 70% interest with BP Minerals Canada holding 30%, is continuing exploratory drilling to determine the ore body size, now estimated at 300,000 tonnes.

The mine is expected to [illegible]roduce up to 300,000 [illegible]nces of gold and more [illegible]n 60 million pounds of [illegible]pper annually.

[7] BC HYDRO BEGINS PLANNING MAJOR TRANSMISSION LINE REINFORCEMENT :: BC Hydro said this week it is once again gearing up to build a third 500 KV transmission line in central BC to reinforce the existing system and to accommodate additional power expected to flow from Alcan's Kemano hydro project beginning in 1994. The 206-mile line was on the drawing board in 1981 as part of Hydro's planned Site C project on the Peace River, but both the massive dam and the transmission line were put on hold as electricity demand slowed. The new line, extending from the Williston substation east of Prince George to the Kelly Lake substation near Clinton, will be built along an existing right-of-way which already contains two 500 KV lines and one 230 KV line.

Hydro says construction of the $178 million line will begin in 1991; in the meantime, the utility will undertake detailed environmental and social impact studies, including a public consultation program. Hydro spokesperson Verne Prior said the Crown corporation will soon apply to the Energy Ministry for a project certificate.

In June, BC Hydro announced plans to build another 500 KV line to reinforce the lower mainland's transmission system; that line will begin at Kelly Lake and extend southwest to the Cheekye substation near Squamish (see CU No. 370 [7]). Prior said there is no relationship between the two projects; a route has not yet been chosen for the Kelly Lake-Cheekye line, which is not scheduled for completion until 1995.

IN OTHER BC HYDRO NEWS, the utility says that, as part of its Resource Smart program, it is evaluating the prospects for generating more power at its 22 MW La Joie dam on the Bridge River. Resource Smart is part of Hydro's long-term resource plan and involves ensuring maximum efficiency at all the utility's generating and transmission facilities (see CU No. 366 [24]). At La Joie, Hydro will audit the existing power plant, study the feasibility of diverting the river and building additional generation and investigate the possibility of moving the plant farther downstream. The current phase of work involves preliminary engineering, social and environmental studies and should be completed by next spring [Karl Stoutl].

B.C. Lill. News
Oct 4/89

SHORT TAKES

OPEN HOUSE

BC Hydro will hold an Open House in Lillooet tomorrow on its proposed Kelly Lake-Cheekye Transmission Line Project. The Open House will be held at the REC Centre from 3 to 9 p.m. The Village Council and Squamish-Lillooet Regional District Board have already strongly urged Hydro to use its existing powerline corridors and have said they would oppose any plans to develop new corridors in the Duffey Lake area.

Squamish (B.C.) Citizen
OCT -5 1989

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BC Hydro invites discussion

B.C. Hydro is in the planning stages of building a second 500 kV line from Kelly Lake to Squamish.

Officials are looking for community input from Whistler, Squamish, Pemberton, Birken, Lillooet, Seton and Clinton residents on the line, scheduled for construction in the mid-1990's. Open Houses will be held through Oct. 14, and residents of these areas are invited to review project information and ask questions.

B.C. Hydro has begun studies for the 200 kilometre line which would supply electricity to the Lower Mainland and Vancouver Island through to the late 1990's. The line, if built, could go directly through Whistler. Two alternate lines have been suggested, but Hydro officials say the route through Whistler is the most feasible at this time.

Concerns such as cancer-causing electric and magnetic fields, vegetation, property purchase, visual impacts, intrusion into wilderness areas and land use and property issues including native lands are expected to come up in the consultation process.

After the round of public discussions, environmental and technical studies will be completed and further studies will be undertaken as required.

Hydro officials will be in Pemberton Oct. 11 at the Municipal Hall. Oct. 12 they go to Blackwater Creek Elementary School in Birken. Squamish gets a chance to air concerns Oct. 13 at the Brackendale Art Gallery, and Whistler will see the officials at Myrtle Philip School. All Open Houses run from 3:00 p.m. until 9:00 p.m.

The Citizen
Page 4
October 5, 1989

Hydro lines a risk

B.C. Hydro says there is no proven relationship between hydro lines and cancer. Well then, it must be okay to string up as many 500 kV lines as needed to supply the energy hungry Canadian. We wouldn't want to be without our heat, hot water or lights.

On the other hand it isn't proven that hydro lines don't cause cancer. What if they do? What do you say to the children who have contracted the disease, after living under an unsafe line all their lives. It brings to mind tragic stories like the Thalidomide babies. It's just not worth it to take the risk.

The proposed 500 kV line from Kelly Lake to Cheekye would pass directly through Whistler. The majority of the power would go to the Lower Mainland and Vancouver Island. It's not fair that Whistler should suffer potential ill effects because this route is the "easiest".

Two alternate routes have been suggested. B.C. Hydro feels the route through Whistler is the most feasible. As a result, officials will be holding open houses through the district to find out what the community thinks about it.

The line wouldn't be constructed until the mid to late 1990's if it's approved, but residents have to act now to voice their concerns.

Whistler is already criss-crossed with numerous power lines. The visual effect alone of a further 500 kV line could prove detrimental to property owners whose houses overlook the proposed route.

Without knowing enough about the effects of such a massive line, B.C. Hydro should not blithely go ahead and plan lines through communities. I'm sure residents would prefer paying more on their hydro bills to dealing with unknown effects.

As well, residents have proven they care about the environment and the effects man-made objects create on the earth. If residents are keen on recycling in this town, which they seem to be, surely they would be keen on cutting down on power usage.

Cutting down on power usage would eliminate the need for such a line to be built. This seems a more sane and logical approach. Ominous-sounding warnings from various studies on hydro lines are convincing. They should be listened to.

It's always better to err on the side of caution. After all, when tobacco was hip, people actually thought smoking improved your health. When the warnings appeared, some people stopped, only to be barraged by warnings of second-hand smoke. The warnings have turned out to be true. Listen to them.

Bridge River-Lillooet News
(Lillooet, B.C.)
OCT 11 1989

(1) of 2

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Don't touch Duffey Lake route for hydro

The messages came through loud and clear at the BC Hydro open houses on the proposed 500 kv Kelly Lake-Cheekye transmission line project:

—Area residents are unanimous in their opposition to any plans to build a transmission line corridor along Duffey Lake.

—Mount Currie residents don't want to see any transmission lines going over their homes in what Hydro describes as the Antoine Creek corridor.

—Seton-Shalalth residents want Hydro to spend some major money to upgrade the Highline road.

Summing up the opinions expressed at last week's open house in Lillooet, Hydro engineering technologist Bryan Hooper told the News, "They'd like to see the line go in existing corridors."

He added that 1984 technical studies identified the existing Mission-Anderson corridor as the route preferred over the Duffey Lake alternative.

"So far, we haven't seen anything to change that. The Duffey Lake Road route has a variety of technical problems. It's very rough terrain, the construction would be difficult, even finding a place to put structures would be difficult. We'd have to go in through the back door of Lillooet, there are Indian reserves, there are aesthetic considerations. Everything that could ever come into play on transmission lines is sitting on that route," he said. "When you add everything up, it's not a popular route."

The native Indian factor could play a key role in Hydro's final decision about where to locate the transmission line. For example, some of BC Hydro's transmission line leases with the Bridge River and Pavilion Bands are due for their 20-year renegotiation and it's expected there will be some hard bargaining over money and other clauses. That is, if the bands want to renegotiate.

"They can kick us out if they want," one Hydro source said. The crown

Continued on page 13

BC Hydro's Bryan Hooper goes over Kelly Lake-Cheekye transmission line details with Linda Lafreniere and her son Basil at the Hydro open house at the REC Centre last Thursday.

Bridge River-Lillooet News
(Lillooet, B.C.)
OCT 11 1989

(2) of 2.

Don't touch Duffey Lake route for Hydro lines

Continued from page 1

corporation also is not allowed to expropriate Indian land.

Hydro Community Relations Co-ordinator Mary Algar told the News negotiations are complicated because some of the lease records were "lost in a fire, some leases are up tomorrow, some at a later date. With the Pavilion Band, for example, there are five rights-of-way on their land alone."

Hydro representatives met last week with Gerry Oleman and say they now want to arrange a meeting with the full Lillooet Tribal Council to review the current situation and discuss the proposed transmission line.

About 50 persons attended the six-hour open house in Lillooet on Oct. 5, while another 12 turned out for the Oct. 4 open house at the Bridge River School.

The timeline for the $170-250 million transmission line project is this:

May to December 1989 — environmental and technical studies.

April 1989 to February 1990 — public consultation.

1990 — regulatory review.

If the project is approved it would take five to five and a half years for the surveying, clearing and construction work to be carried out.

The project could be in service as early as the fall of 1995, to meet the expected increase in the power needs of the Lower Mainland and Vancouver Island.

SLRD Notes

B. R. Lill. NEWS. OCT 11/89

Duffey Lake Park proposed

The Squamish-Lillooet Regional District Board wants the provincial government to preserve Duffey Lake as a Class A Provincial Park.

The matter was raised at the board's recent meeting in Lillooet by Squamish Director B. D. Giles, who stated that because Duffey Lake is a pristine alpine lake and the north side of the lake is unspoiled, it would be a good idea to protect it from development.

...

need for a streetlight at the intersection of Highway 12B and Smith Road. He said traffic count results indicate 60 cars an hour are using the road, but it's difficult to see the intersection at night and residents want a light installed before an accident occurs.

The board will write to the Ministry of Highways requesting that a streetlight and appropriate signs be installed at this intersection.

...

BC Hydro representatives Dick Enns, Jeff Barker, Mary Algar, Karen Cook and Dr. Kelly Gibney also appeared as a delegation at the Sept. 28 meeting to discuss the open houses on the Kelly Lake-Cheekye transmission line. They advised the board that identification of community preferences will lead to resolution of issues and revision of the project plans.

Dr. Gibney also discussed the effects of electro-magnetic fields (EMFs) and said that although associations have been made between EMFs and cancer and EMFs and birth defects, the experiments have not been conclusive. Electro-magnetic fields do affect the heart beat, calcium exchange between cells and sleep habits and further research is being done on the biological effects of EMFs.

...

Area A Director Sally Garrard has been asked to prepare a plan for the board regarding the options available for library service. Discussions on the issue will continue with the Cariboo-Thompson-Nicola Library System.

...

Director Garrard reported that the Ministry of Highways has removed its house trailer in Gold Bridge, leaving a septic system in the ground. Administrator Ian Knowles was asked to look into acquiring the system as a sani-station for the area.

Creston Valley (B.C.) Advance

OCT. 12 1989

B.C. HYDRO 2 88

To meet demands for electricity in the Vancouver area in the 1990s, B.C. Hydro has started consultations with municipalities on a route for a second 500 kilovolt transmission line from Kelly Lake substation near Clinton south of 100 Mile House to the Cheekye substation in Squamish.

Whistler (B.C.) Question
OCT. 12 1989

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Local power projects sign of the times

The demand for electrical power in B.C. is growing at such a rate that B.C. Hydro says it will have to build the controversial Site C dam on the Peace River, it's just a matter of when. However, the utility has initiated several programs to conserve energy and find alternative sources of power, in an effort to delay construction of the dam.

According to the Vancouver Sun, Hydro chairman Larry Bell's efforts in procrastination have gone so far as to offer Howe Sound Pulp and Paper an interest-free loan of $108 million for installation of turbines so the company can produce it's own power when it modernizes its kraft pulp mill.

As Hydro plans for the province's power needs at the turn of the century upgrades and smaller generating projects are being encouraged across the province. No doubt some will encounter stiff opposition.

Locally, the big Hydro issues will be a second 500 kV power line which may be built through the Whistler valley, and two private power generation proposals: a 20 megawatt project on the Mamquam River and the Meager Creek geo-thermal project.

The replacement of one of the 230 kV power lines between the Kelly Lake substation and the Cheakeye substation with a 500 kV line is necessary to service the Lower Mainland's increasing demand for reliable power, according to Hydro. The questions are which route the new line will take and when it will be built.

The July decision by the B.C. Utilities Commission that there was "insufficient evidence to support the presumption of an actual health risk" from electromagnetic radiation caused by power lines doesn't eliminate all concerns about radiation - research into the matter continues - but it certainly makes Hydro's job easier than if the commission had ruled there are identifiable health effects.

Environmental concerns about the Mamquam and Meager Creek proposals may also surface if they get the go ahead. The Mamquam proposal, which would add power to Hydro's B.C. grid, has been short-listedwhile no decision has been made on Meager Creek, which is a proposal for power to be exported.

The utility is making an effort to he public concerns, witness Wednesday's op house in Pemberton on the 500 kV line a another in Whistler this Saturday. Chai man Bell is also demonstrating an opene to new and alternative sources of power the Site C dam, which will cost millions dollars and millions of acres of land.

But if Hydro's estimates for power d mand are accurate the whole province w be feeling the results. The company h had a major impact on the B.C. landsca in the past and will again in the future.

The utility certainly holds most of t cards and the options are limited: to bui the 500 kV line through the Whistler va ley or through a previously untouched va ley; to encourage smaller projects, eve though there may have an impact on t local environment, or to build the Site dam now.

To some it may seem like a no-win sit ation, but the next step, if hydro-electr power is deemed too harsh on the enviro ment, may be to go to nuclear power.

- *Bob Barnet*

Squamish (B.C.) Citizen
DEC 12 1989

Powerline options discussedat open house

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by Mike Mooney

Over 60 people visited BC Hydro's open house at the Brackendale Art Gallery last Friday to learn about the utility's plans for the area.

One in a series of seven, the meeting was typical of those held in communities on or near any one of the several possible routes which a proposed 500 kilovolt line might take between the Kelly Lake substation north of Lillooet and the Cheekye substation near Squamish.

The people attending wanted to know more about the routes and said they welcomed the opportunity to express their concerns to Hydro.

"At least they're not coming in with the bulldozers," Squamish resident Dawn Fryer said. "They're talking to us and that's good."

Many people who might be interested in talking with Hydro about its plans were not there. Upper Cheakamus convention center developer Ferdinand Vondracka said.

"There are people living close to the lines, who may not have heard about these meetings."

Direct mail to those people would be the best method of contacting them, he said.

Beyond the property, environmental and aesthetic concerns over the routes many people wanted to know more about the alleged health effects associated with the electromagnetic fields (EMF's) which accompany transmission lines and other electrical conductors.

Hydro staff fielded the questions in the informal setting.

One routing plan is to remove one of the old, low voltage lines from Seton Portage to Cheekye and replace it with a new, higher voltage one, Hydro Project Planning coordinator Billy Ellis said.

The new line could follow the old right-of-way as much as possible, though the old right-of-way was surveyed in the 1940's and "there are places we can improve on visual and other impacts," he said.

"It's better that they go through the existing route than destroy virgin forest," Squamish resident Robert Perkins said.

If power lines go through residential areas, then Hydro should pay municipal taxes, Squamish mayor Phil Turner said.

"If we're going to be inconvienced by these lines bringing power to other areas, then they should pay."

The towers are an inconvience to local people affecting their property val-

Cont'd on page 19

flow can be managed smoothly, he said.

"The load forecast plan, the resource plan and the system development plan do not include export (to the U.S.)," he said.

The plans are based on forecast domestic need, he said.

The proposed line between Kelly Lake and Cheekye appears to be the best way of resolving the problem of transmitting the higher load of electricity to southwestern B.C., he said.

The Squamish Times

Oct 89

Hydro gave a 'snow job' at open house

Dear Editor,

At the public BC Hydro meeting at the Brackendale Art Gallery you could tell Hydro was well prepared, sending some top gun P.R. people to put on quite a spread to butter up the people who are objecting to putting a second powerline through the Upper Cheakamus.

Anything that you read in the papers concerning harmful affects of the magnetic field from the transmission lines was belittled or said to be not true, as stated by those P.R. people.

In other words, it was a real snow job, because they more or less made up their minds which way they want to run their lines, no matter if people are objecting to some of their routes or not.

The new transmission line could be run along the present two lines along the highway. Naturally it costs more to run them along the highway, as on the hollow of the Cheakamus Valley.

Hydro already wants to raise its rate nine per cent and could charge the U.S. customers more to offset the cost.

It's better to have good public relations by not buttering people up, but by respecting and heeding the public input, to avoid latter confrontations.

Helmut Scherer

Squamish (B.C.) Times

OCT -3 1989

Hydro admits to power line health effects

288

By Mike Mooney

BC Hydro is proposing to put another high voltage power line between Lillooet and Squamish.

Hydro presented a number of proposed routes for the line to the Squamish-Lillooet Regional District at its Sept. 25 meeting in Lillooet.

The line would feed into the Cheekye substation then pass through existing lines at a higher amperage to Vancouver and Vancouver Island.

While SLRD directors were not firm on whether or not they approved of the lines in general, they did say they preferred a route following existing lines.

The routes north of Anderson Lake were the only ones the directors said they were interested in considering.

Hydro also proposed a route along the Duffy Lake Road, which did not meet with SLRD approval.

"I'm distressed to see detailed studies on the Duffy Lake Road route," Director Joyce Harder said.

"Why would you continue to study the route when it's been so vehemently opposed?" Director Corrine Lonsdale asked the Hydro representatives.

"Why spend the money when it's not going to go through?"

"We are opening up all the options, so we can make the best decision," BC Hydro project manager Jeff Barker said.

From the Cheekye substation north of Brackendale, the electricity would be passed on to Vancouver and Vancouver Island through existing lines.

Amperage would be increased, not the voltage, Barker said.

He addressed directors' concerns over reports of health effects associated with electromagnetic fields.

He said electromagnetic fields did have effects on the heart beat, calcium exchange between cells and sleep habits.

Experiments to determine whether or not electromagnetic fields cause cancer and birth defects were not conclusive because when experiments were repeated, the same results did not occur, he said.

Electromagnetic fields such as those found under high tension power lines can shorten human heart beats by three beats a minute, he said.

He added that the fields also affect calcium ions which are important to bone structure.

Exposure to magnetic fields results in a decrease in the production of melatonin, a hormone governing sleep habits, he said.

"It's like turning the light on," said BC Hydro project manager Dr. Kelly Gibrey, who also attended the meeting.

A study has shown that people living within 150 meters of a high tension powerline displayed an increased incidence of a bone cancer known as leukemia, he said.

However, people in the same group living within only 25 meters of the lines suffered from leukemia no more frequently than the general population, he said.

This is contrary to what researchers expected to find, he said.

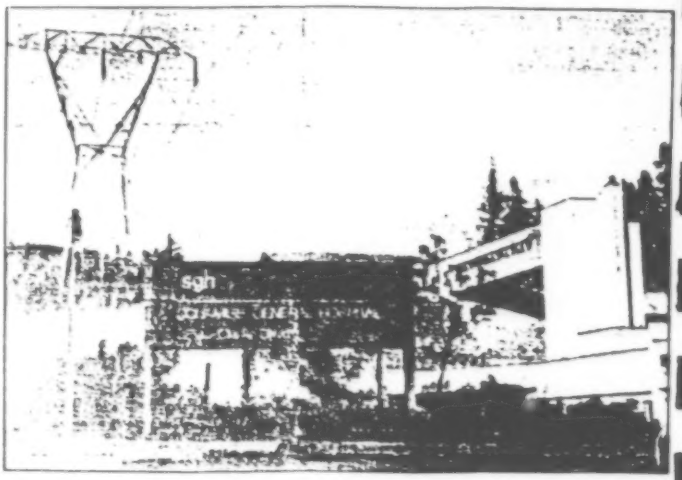
As you get closer to a source, you expect the effects to become more severe, he said.

Giles said this does not mean electromagnetic fields do not cause or weaken bodies making them susceptible to cancers.

The body includes many subtle electric fields, he said.

It may be that when you're very close to the wires the internal and external fields do not harmonize in a detrimental way, but further away they do, he said.

Giles said the effects on the heart, calcium and sleep were enough in themselves to be of concern.



Two-hundred and thirty volt lines loom large over the Squamish General Hospital.

Smoking and drinking are bigger known health hazards, said Gibrey.

BC Hydro will hold an open house for discussion of the proposals on Friday, Oct. 13 from 3 to 9 p.m. at the Brackendale Art Gallery.

More information is available from BC Hydro, External Relations, 18th floor, BC Hydro, 970 Burrard St., Van. B.C., V6Z 1Y3.

Squamish (B.C.) Times

OCT. 17 1989

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POWER LINE

route and health effects discussed at open house

By Mike Mooney

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If power lines go through residential areas, then Hydro should pay municipal taxes, Squamish mayor Phil Turner said.

"If we're going to be inconvienced by these lines bringing power to other areas, then they should pay."

The towers are an inconvience to local people affecting their property values, he said.

The proposed 500 KV line will replace an older 230 KV line to reinforce the power transmission system, Ellis said.

Projected growth of power consumption means transmission capabilities must be increased so the flow can be managed smoothly, he said.

"The load forecast plan, the resource plan and the system development plan do not include export [to the U.S.]," he said.

The plans are based on fore-

Cont'd on page 2

Squamish (B.C.) Times

OCT. 17 1989

Environmental affects of hydro lines questioned

From page 1

cast domestic need, he said.

The proposed line between Kelly Lake and Cheekye appears to be the best way of resolving the problem of transmitting the higher load of electricity to southwestern B.C., he said.

The Cheekye substation feeds power to both Vancouver and Vancouver Island.

The existing line into Cheekye is one of the most heavily used in B.C., he said.

The south west corner of the province, which includes both the Lower Mainland and Vancouver Island consumes 70 per cent of the electricity used in B.C., he said.

The consumption in the area is also increasing 75 per cent faster than the rest of the province.

The lines into the area must be improved so the system can cope with damage to the transmission facilities without the customers noticing, he said.

"The idea is to develop a system capable of coping with the loss of a major component; for example a powerline due to a rock slide."

Upgrading the existing line between Kelly Lake and Cheekye, which is the oldest, lowest capacity line in the system, would be the best way to improve the system, he said.

Kelly Gibney

Another powerline would not be built south of Cheekye through Squamish, but the electrical current through the existing lines to Vancouver and the Island would be increased.

The magnetic fields around the lines will be more powerful when the amperage is increased, he said, and electrical fields would remain constant with the voltage.

None of the local people attending the meeting who talked with both the Hydro representatives and The Times felt enough was known about the health effects associated with EMF's, though none suggested the lines should not be put through.

"We all use electricity and they've got to put the lines somewhere," Perkins said.

"Is there enough information to know if there is a risk to doing this?" asked Upper Cheakamus resident David Ewert.

"I wish we knew more about the environmental and health effects," Perkins said.

He said Hydro's expert on electromagnetic fields, Kelly Gibney explained the issues as fully as he could, "but it wasn't enough."

"The problem with the health effects of EMF's, is that you can't prove the health effects one way or the other," Turner said.

An independent survey by the Canadian Medical Association, might have more credibility then Hydro presenting the information, Fryer said.

Billy Ellis

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Burying the lines, especially in residential areas, would solve some of the health and aesthetic concerns with the power lines, Turner said.

Burying the line would not solve the EMF problem, Gibney said.

"The field falls away more quickly, but immediately over the line, which would be about 18 inches underground, you would experience the fields more intensely than if you stood under lines which were 20 feet overhead."

Squamish (B.C.) Citizen
OCT 12 1989

Kelly Lake/Cheekeye hydro effects not known

From page 9

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S.R. LILLOOET NEWS. NOV. 8, 9.

SLRD Notes

Board wants citizens advisory group to look at Kelly Lake-Cheekeye Project

The Board of Directors of the Squamish-Lillooet Regional District has declined BC Hydro's invitation to attend a half-day workshop on the corporation's Kelly Lake-Cheekeye 500 kv. transmission line project.

Instead, the board passed a motion that calls for the establishment of an advisory group representing citizens from Bridge River, Seton, Shalalth, Birken, Whistler, Daisy Lake, Cheakamus and the Indian Bands to look into the transmission line proposal.

•••

Board members defeated Area B Director Hans Thur's motion calling for the board to authorize Administrator Ivan Knowles to spend one day a month in Area B, where he would be available to meet with members of the public and to discuss issues with Village representatives.

Board members said Mr. Knowles already has enough work to do at the SLRD's Pemberton office.

•••

Power line advisory panel being formed

WHISTLER QUEST, NOV 9, 89

A citizens' advisory panel will be formed to represent public response to B.C. Hydro's proposed 500 kV power line between Clinton and Squamish.

The panel was proposed at the most recent meeting of the Squamish-Lillooet Regional District. It will consist of representatives from each of the communities that would potentially be affected by the power line, including Whistler.

Paul Burrows, Whistler's director on the regional district board, said that, at this point, only the intent to form the panel has been formalized.

The advisory group will consist of people from outside the board. They will either be appointed or advertisements will be placed in newspapers, calling for volunteers to sit on the panel.

Representation will be solicited from Bridge River, Seton, Shalalth, Birken, Daisy Lake, Cheakamus and the affected Indian bands, as well as from Whistler.

B.C. Hydro has said that projected demand from the Lower Mainland and Vancouver Island through the mid-1990s necessitates the construction of the 500 kV Kelly Lake-Cheekye power line.

Whistler Q.C.

NOV. 9, 89

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SLRD taking steps to establish park in Duffey Lake area

By Andy Jukes

With an expected increase in traffic between Lillooet and Pemberton after the Duffey Lake Road is paved, the Squamish-Lillooet Regional District is exploring the possibility of creating a provincial park in the area.

At a special meeting of the district's board Monday, the directors voted to send letters to the appropriate provincial ministries, including Forests, Parks, Lands, Highways and Mining, expressing the desire for a new provincial park.

"We want to preserve public recreational opportunities in the area," said Paul Burrows, who represents Whistler on the board.

Burrows said the letters will be sent in order to determine if there are any applications from private interests which would conflict with a new park, as well as formally expressing the desire for a park.

Burrows said there are apparently some applications filed for private recreational use of areas along the Duffey Lake Road. The nature of the applications is unknown and there are no services to the area.

"We want to be sure the government is aware that we're concerned about future use of the area," said Burrows.

The Duffey Lake Road is also one of the routes B.C. Hydro is considering for its proposed 500 kV power line between Clinton and Cheekye. At public hearings last month residents in D'Arcy and the Anderson Lake area opposed putting the line through their valley and suggested it would be better to build it along the Duffey Lake route.

A short section of the Duffey Lake Road was paved this fall and work crews are continuing to hard-surface the road. However, no announcement has been made as to when the whole road will be paved.

NOV. 15, 1989

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Hydro facing a power-gobbling province, chairman says

By Mike Mooney

BC Hydro's chairman came to Squamish Oct. 30 to meet with invited representatives of local political bodies, businesses and the media.

After outlining B.C.'s power needs and what Hydro is doing to meet them, BC Hydro chairman Larry Bell opened the floor to questions.

Due to the unexpectedly high growth of consumption over the past few years, Hydro will be operating at closer to capacity than it expected to be, he said.

The less surplus power there is available, the greater the likelihood of power shortages, he said.

Also, the per capita use of energy in B.C. is the highest in the world.

British Columbians annually use 8,000 kilowatt hours per customer, which is twice that used in Britain and France and 1,000 kW.h more than Californians do.

British Columbians use more electricity than the rest of the world because it is so cheap here, he said.

To reduce demand, the crown corporation is both raising prices and encouraging customers to use less energy through the Power Smart program.

The program offers incentives to switch to power efficient motors and appliances as well as offering power and money saving tips.

The profits made from raising prices should be put towards servicing Hydro's debt, not bolstering the province's revenues, Squamish alderman Brian Giles said.

Paying the extra revenue to the province would in no way hamper payment on the utility's debt, Bell said.

A sliding scale of increasing rates for high usage or using during peak times, might help reduce demand, Howe Sound school district trustee Peter Gordon said.

Managing a sliding rate is difficult to make it seem fair and understandable, Bell said.

Use of alternative sources of power -- such as solar power -- should be subsidized, Gordon said.

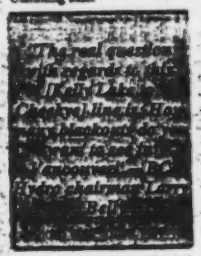
Solar energy can be used where it makes economic sense, but natural gas generally makes better economic sense, Bell said.

Because most of the consumption growth is in Vancouver while the power is generated in the far corners of the province, a large transmission system is needed to meet the demand.

Establishing a higher capacity line between Kelly Lake and the Cheekye substation is an important part of reinforcing the transmission system so it can handle that demand, he said.

He agreed to consider either a grant in lieu of taxes or paying taxes directly on land occupied by the power lines.

Distribution lines in municipalities would not be included, Squamish-Lillooet Regional District chairman Dan Cumming said.



"Some people [in the district] have those bloody great transmission lines going through their back yards and yet they don't have electricity themselves."

Concerns with the health effects associated with the electromagnetic fields (EMF) surrounding power lines were raised.

Gordon wanted more information on the health effects made available to the school district because playgrounds of two of the schools are under power lines.

Hydro representatives could make a presentation to the board, on request, Bell said.

The power lines should be located or relocated out of the valleys and away from the people, Mayor Phil Turner said.

"The visual pollution is a major trade off."

"People don't want the lines through the pristine valleys either," Bell said.

The concern over the possible health effects of EMF's have been exaggerated, he said.

There is no scientific evidence linking EMF's to leukemia or any other cancer, he said.

Sleeping under an electric blanket or with a clock radio by your head exposes you to a stronger field than being under a 500 kV line, he said.

"If there is evidence to the contrary, I will be the first to consider changes."

Areas concerned with the effects of power lines, should concentrate on conserving energy, he said.

"If you want me to manage to zero growth [and not build new power generation and transmission facilities], that can be done."

But people have to figure out how much power they want to use, because high demand and low production facilities do not complement one another, he said.

"The real question, with respect to this [Kelly Lake to Cheekye] line, is: how many blackouts do you want to see in Vancouver?"

"The consequences of a blackout are not limited to Vancouver, Quebec recently had a province-wide blackout," he said.

The utility's planning criterion is to allow for one significant blackout in 24 years, he said.

Because energy is created to meet consumption on demand [as more electricity is used, more water is allowed to flow through the turbines; the system has little storage capacity] larger production and transmission facilities are needed to meet the expected demand.

Cont'd on page 7

Hydro chairman Larry Bell keeps his pointer on the bottom line in discussion with representatives from the regional district and municipality.

Squamish (B.C.) Times

NOV 15 1989

Hydro chairman responds to concerns

From page 4

With continued growth of consumption by five percent a year, a Peace River "Site C"-size project will be needed every two years, he said.

Though the power generated by Hydro's relatively smaller Independent Power Projects (IPP's) will help put off the larger ones, in 2013 Hydro will have to choose between projects on the Peace River, Stikine River or Hat Creek, he said.

"Some people have these bloody great transmission lines going through their back yards and yet they don't have electricity themselves" – SLRD chairman Dan Cumming

IPP's will generate power both to augment Hydro's supply and for foreign sale, depending on the category.

Near Squamish, the two-megawatt Monmouth Creek project would be of the former category, while the 20-megawatt Mamquam River project is of the latter.

IPP's were both hailed and condemned at the meeting.

Western Pulp general manager Waldie Manion praised the program and said Woodfibre is considering asking for Hydro's assistance in establishing a co-generation facility with the new power boiler planned there.

The boiler would not only help meet the mill's power needs, but would also help dispose of residual toxins in sludge from the secondary treatment of effluent, he said.

Giles criticized both the IPP's and the way Hydro has handled the proposals.

Squamish does not want either the Monmouth Creek or the Mamquam River projects, he said.

He said he personally found the Monmouth proposal "abhorrent" and "immoral."

The IPP's were done behind the public's back, Giles said.

Hydro is giving the public a run-around by soliciting proposals without asking the public if they want them in the first place, he said.

"If you want every hair-brained scheme to come through your system, we can fill the room with them," Bell said.

If Hydro needs the power from these facilities, why is it selling it to the States? Giles asked.

Why should local scenery be messed up to subsidize American industry?

Why should communities like Squamish suffer the impacts of the IPP's, while the benefits go elsewhere?

"I am not against the process if the power is used locally," he said.

The SLRD approves of the projects in principal, but has reservations about particular ones, Cumming said.

The power sold to the States is surplus water which would have poured over the spillways and been wasted, Bell said.

It is sold to the States on the spot market, which means they are one-time sales, not long-term contracts.

It is known as "interruptable" power, because it is not continuously or reliably available to the foreign customer.

The system has some surplus water due to planning to meet peak demand during low water as a result of a draught.

The utility has realized "significant" gains from water which would have been otherwise "wasted," Bell said.

The Squamish Times

Dec 89

Hydro to store PCBs north of Pemberton

By Mike Mooney

BC Hydro received permission from the Squamish-Lillooet Regional District Nov. 27 to temporarily store PCB's until a destruction or disposal facility is available in B.C.

Up to 180,246 kilograms of liquid PCB's and 1,199 kilograms of PCB-contaminated solids will be stored at BC Hydro's Creekside capacitor station north of Pemberton.

> *"The problem is the lack of an adequate facility for handling such wastes, which is a failure of the provincial government" -- Director Brian Giles*

The application, submitted through the Waste Management Branch, states that the waste will be stored in "dedicated storage containers and storeroom with proper spill containment, all located within a fenced, restricted access yard."

The application is not for toxic waste coming into the region, but for material already existing in it, Director Brian Giles said.

"They are simply registering the existence of the waste. "The problem is the lack of an adequate facility for handling such wastes, which is a failure of the provincial government."

The board handled questions on non-toxic waste and recycling separately.

Handling toxic waste has become a growing problem throughout the province, as evidenced by allegations of waste permit violations by local governments such as the Greater Vancouver Regional District for both the effluent from the Iona Sewage Treatment facility and the incinerator in Burnaby.

Victoria's toxic waste disposal site was declared full last week and the Nanaimo one is near capacity.

Squamish does not have a toxic waste disposal site.

SUNDAY
THE VOICE OF NORTH AND WEST VANCOUVER
north shore news
January 14, 1990 News 985-2131 Classified 986-6222 Distribution 986-1337 56 pages 25¢

HEALTH FEARS RAISED OVER DOUBLING CURRENT AT OUTDOOR SCHOOL

Hydro line upgrade plan jolts NV School Board

A PROPOSAL by B.C. Hydro to upgrade a transmission line has sparked some opposition from North Vancouver School Board (NVSB).

By SURJ RATTAN
Contributing Writer

The utility company is proposing to upgrade its Kelly Lake to Cheekye transmission line, which runs through the North Vancouver Outdoor School near Squamish.

The hydro-electric line currently carries 230 kilovolts and the proposed upgrading would boost that amount to 500 kilovolts, which would result in doubling the voltage and transmitting about four times as much power as it currently emits.

Outdoor School staff have raised concerns that the upgrading would pose health and safety hazards to students and staff, and that the move would take away about five acres from the school property. There are about 80 students who use the facility every day year round.

If a new line is installed, the existing towers would be replaced with taller towers and that would require an expansion of the right-of-way from the current 140 feet to about 200 feet.

"This will require clear-cut logging of at least five acres of timber on the school site," NVSB staff member Patrick Bell told the board Tuesday night. "Most of this loss will be to the west of the existing line, into an area widely used for nature appreciation and transfer trails to the giant cedar stands."

Bell added that the school staff are also worried about the "possible negative long-term health effects of the electro-magnetic fields.

"While the research in this is not definitive, there is a body of research which is causing genuine concern for those who must live and work within the electro magnetic field of this power line," he said.

The school board voted to send a letter to B.C. Hydro stating the board opposes any upgrading to the transmission line.

B.C. Hydro recently held public meetings in Squamish to tell area residents about its proposed upgrading of the transmission line. It is also considering upgrading options for the transmission towers which do not sit on the Outdoor School site, because the school sits on property bordering on the Squamish Indian Band reserve, over which B.C. Hydro has no jurisdiction.

TRANSMISSION LINE

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BC Hydro says it will be holding further public consultation meetings this year to discuss plans for its Kelly Lake-Cheekye 500 kV transmission line project. Following a series of open houses and meetings with elected officials and area Indian bands, Hydro's project team now is conducting an internal review of route options based on environmental, technical and public consultation. Next month, the corporation plans to distribute a second newsletter and interim project report. That will be followed by more public consultation meetings in March, an internal review of outstanding issues and concerns in April and the submission of an application to the Ministry of Energy, Mines and Petroleum Resources in May.

Bridge River-Lillooet News
(Lillooet, B.C.)
JAN 31 1990

Whistler (B.C.) Question
MAR -8. 1990

286

Hydro moving toward biological control of vegetation growth

By Matthew Plumtree

In an attempt to demonstrate new techniques and a revised attitude towards the environment, B.C. Hydro held the first of three Vegetation Management Policy meetings in Squamish Tuesday.

According to B.C. Hydro Lower Mainland Transmission Manager Denis Blakely, the power company in the past had been guilty of poor practices when it came to eradicating transmission line growth.

"There was a perception, I think, that all we did was head down the right-of-way, turning everything brown; making linear bowling lanes."

Blakely suggested those poor practices were a thing of the past and that with the new emphasis on biological control, B.C. Hydro was eager to demonstrate its vegetation management program.

The two main methods of controlling growth this year will be a "slash and treat" and "slash only." Of all the control work, 65 per cent will be the slash and treat, wherein herbicides - primarily Roundup - are used to augment physical control methods.

Eventually, by relying on "selective, site and species specific herbicide applications" the use of herbicides will diminish as biological control takes over.

Between Squamish and D'Arcy roughly 60 km of right-of-way will be subject to herbicide and physical treatment. A further 35 km will simply be physically controlled. Contractors will be hired to perform the work with herbicide applications to begin in the spring.

The meeting, attended by representatives of Federal Fisheries and Oceans, the municipalities of Whistler, Pemberton and Squamish, touched on the necessity of controlling right-of-way growth, the problems associated with control and current methods of control.

Besides creating a serious fire hazard, production supervisor Larry Ratzlaff explained, tall trees can disrupt service and endanger Hydro workers on the job. Major troublesome species include tall-growing deciduous trees and brush such as red alder, birch, aspen, and maple. The quick-growing species pose a major problem on many right-of-ways, he said. The tall conifers, while still a problem, are much slower growing and regeneration does not usually occur when the trees are cut. Each cut deciduous stem usually regenerates quickly resulting in a problem that soon multiplies.

"Long-term effective control at reasonable costs can only be realized by emphasizing biological control," Ratzlaff said. "That is, discouraging the growth of the taller, undesirable plant species by encouraging and maintaining either a dense cover of low growing, native vegetation or in establishing Christmas tree farms, agriculture.

"Many of the low-growing native plant species provide excellent browse for wildlife in addition to biological control through competition with the unwanted tall-growing plant species."

The spokesmen acknowledged they were still early in the biological control program and estimated it might be 20 or more years before the idea is fully implemented.

The preferred methods nowadays, replacing the aerial spraying and hose applied spraying of the past, are through tree injections and cut surface treatments.

B.C. Report (Vancouver, B.C.)
APR 16 1990

TRANSPORTATION

288 copies [illegible] 5246-FS

EXTERNAL RELATIONS

On the road to Lillooet

An Interior town has high hopes for a new highway

More than two decades ago, legendary Lillooet newspaper editor Margaret "Ma" Murray had a dream—that a twisting, narrow, precipitous logging road through B.C.'s Cascade Mountains would one day become a highway linking the Interior with the Lower Mainland.

Twenty years—and $22.5 million later—Ma Murray's dream is coming true. With the spring thaw, construction crews will soon return to complete a major upgrade and reconstruction of the Duffey Lake Road, a 100-kilometre link between Pemberton and Lillooet. Depending on what this month's provincial budget has to offer, paving of the road could be completed, on schedule, by September.

The two-lane ribbon of blacktop will provide a third route between Vancouver and the Interior, as well as fast and easy access to the booming, year-round resort of Whistler, from northern B.C. and Alberta. Whistler, Pemberton and Lillooet are all expecting immediate economic benefits from the highway project, but civic leaders from Horseshoe Bay in the south to 100 Mile House in the north have also jumped on the Duffey Lake bandwagon in anticipation of new tourist dollars.

Lillooet Mayor Joyce Harder was in the forefront of the battle to have the road upgraded. She says it took nine years of intensive lobbying before then-Highways Minister Neil Vant announced in August 1988 that the road would be paved. Now, she and the 1,760 people in her community await the changes the Duffey Lake Road improvements will bring. "Without a doubt, there will be economic benefits here," she says. "People will inadvertently discover our community. And we think that once they discover B.C.'s little nugget, they will recognize the opportunities for development here. We've got low land prices and low taxes and we're only three hours away from the big city."

Still, Mayor Harder does not foresee the day when the Duffey Lake Road will be a major highway on the level of the Trans-Canada or the Coquihalla. For one thing, she says, the cost would be prohibitive. And for another, she doesn't think the people in the Interior particularly want a speedier road where the traffic simply whizzes by.

The great variety of scenery encountered along the road is considered its main attraction. While some motorists were taking the fastest possible route from Vancouver to Kamloops and points east, others—about 170 vehicles a day last year, according to Ministry of Highways statistics—were discovering the little-known pleasures of the more leisurely Duffey Lake route.

But now that more travellers will be discovering the Duffey Lake Road, preserving that beauty has become a priority for community leaders and concerned citizens. B.C. Hydro has announced plans for a 500-kilovolt transmission line to run between Kelly Lake, near Clinton in the Cariboo, and Cheekye, near Squamish. And one of the suggested routes for the tall transmission towers is right along the Duffey Lake Road. But the prospect of transmission lines snaking across the mountain-sides leaves most area residents cold. And they testified to that effect last fall at a series of open houses in communities along the proposed power line routes.

To protect at least some of the area from possible encroachment by Hydro, the Squamish-Lillooet Regional District Board has asked Victoria to create a Class A Provincial Park at Duffey Lake. Although no decision has been made yet, Mayor Harder says that the Squamish-Lillooet Regional District and the village of Lillooet are "both adamant that the new transmission line should not be constructed along that route. That's definite."

WENDY FRASER

Mayor Harder: *A chance discovery.*

Well into last fall, road crews were busy widening some sections, realigning others, blasting out rock overhangs and replacing single-lane Bailey bridges with new two-lane spans. Ministry of Highways construction manager Rob Ahola expects work to continue south of Lillooet until the snow melts. Then, next month, the crews will go back to work upgrading the Pemberton portion of the road.

WENDY FRASER

Road work: *A third route to Vancouver.*

When the job is complete, travellers—once they get past the congestion and hectic pace of the Squamish Highway—can relax and enjoy the drive through the rain forest to Pemberton. East of Pemberton, the road begins its climb into the rugged Cascade Mountains through alpine meadows and beside meandering creeks, past glaciers and icefields, skirting Duffey Lake itself and slicing deeply into mile after mile of wilderness.

Of course it remains to be seen how many people will choose scenery over speed.

—Wendy Fraser

Lillooet (B.C.) News

MAY -9. 1990

Hydro transmission line report due this month

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BC Hydro has tentatively set later this month as the time for distributing its report on the environmental and technical route studies and public consultation on the proposed Kelly Lake-Cheekye 500 kV transmission line.

But that date is only tentative and subject to change, Hydro project consultant Kevin Graeme told the News.

Last fall, approximately 300 persons attended eight open houses on the project, relaying their concerns and comments to the Hydro team. Here in Lillooet, they were told the overwhelming majority of citizens are against any transmission lines in the Duffey Lake area. Yalakom Valley residents also registered their objections to any lines in their area. Hydro has also run into opposition from area Indian bands, who don't want additional power lines on their reserves.

A Hydro news release says the project team has spent the spring "incorporating public concerns and ideas, along with the results of environmental and technical studies, into their reviews of transmission line route options.

"We intend to hold further public consultation events later this year to provide an update of our project plans and further consultation," the release says.

Following the release of the report, Hydro plans to distribute a second newsletter and then, after further public consultation, hold an internal review of outstanding issues and concerns.

It will then submit the project application to the Ministry of Engery, Mines and Petroleum Resources.

Squamish (B.C.) Citizen
MAY 25 1990

BC Hydro looking for input on 500 kV line

288

BC Hydro will be holding a second round of open houses on their proposed 500 kilovolt transmission line from Cheekye substation near Squamish to Kelly Lake substation near Clinton.

The proposed line passes directly through Whistler, adjacent to one 500 kV and two 230 kV lines. On the whole, BC Hydro said in a company newsletter "People wish us to follow the existing lines as much as possible and not to open up new rights-of-way. While there is generally agreement on the use of the existing transmission corridor, in some areas further discussions are still needed. For example the option through the Resort Municipality of Whistler."

An open house held in October last year brought forward concerns about the use of 41 kilometres of productive forest land through the Soo Valley. As well, the report states "The line goes through areas of possible future recreational importance to Whistler."

Other concerns included environmental impact, visual impact and the affect of electric and magnetic fields.

The second 500 kV line was planned in the latter half of the 1970s, but declining electricity demand halted the project until two years ago. Because of increasing demand in the Lower Mainland, a second 500 kV line is once again being considered.

The proposed 200 km line (depending on the selected route) could be in service as early as the fall of 1995. BC Hydro is relying on public consultation at this point to determine the best route.

The results of public meetings and environmental and technical studies will determine whether the project is feasible.

If so, BC Hydro will apply to the Ministry of Energy, Mines and Petroleum Resources for approval to construct the project.

The project team will be in Whistler June 6 from 4-8 p.m. at the Conference Centre. June 7 the team can be found at Pemberton Secondary School from 4-8 p.m.

Squamish (B.C.) Times
MAY 29 1990

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Hydro proposal back

BC Hydro is bringing its 500-kilovolt Kelly Lake to Cheekye transmission line proposal back to Squamish this coming Monday at the Brackendale Art Gallery.

The Crown corporation will be soliciting public comment on the transmission line route options developed in response to the public meetings gathered last October.

The increased power through the lines raised concerns over the possible health effects of the electro magnetic field (EMF) around the lines and their increased visibility when new, taller towers are constructed to carry the lines. BC Hydro maintains that EMF has a biological but not a health effect on animals, including humans.

Hydro wants to expand the capacity of power it can transmit into Southwestern B.C. through Sea to Sky Country from 230 kV to 500 kV to meet demand which has been growing more quickly than the company expected.

If the growth trend continues and the Interior to Lower Mainland transmission system is not reinforced, Hydro predicts service to customers could be reduced and the risk of a black out increased.

While the bulk of the power lines in Sea to Sky country carry power out of the area, the corridor is just as reliant on them for power as Vancouver is, BC Hydro project manager Jeff Barker told The Times May 25.

"In system transmission planning terms, Squamish is a part of Vancouver. Therefore the reliability of service to the Lower Mainland correlates to the reliability in the Sea to Sky Corridor."

He noted that demand has rapidly increased in both Squamish and Whistler.

A Hydro newsletter being mailed to households in communities along the route notes that three sub-option routes have been identified through the Lower Cheakamus Valley.

The south sub-option is the route Hydro expects will least upset Lower Cheakamus residents, which include the North Vancouver Outdoor School, and the Cheakamus Indian Reserve.

While this route is not free of complications – it passes near a mythological site of the Squamish Indian Band – it avoids both the outdoor school and the reserve. Further studies will be needed to assess what impact on the site power lines along that route might have.

The other possible two routes are known as the west and east sub-options.

The east sub-option would be more visible than the existing route and would cut through the Brohm Lake recreation site.

The western sub-option would be visible from both Highway 99 and the valley floor. It may also cause siltation of the Cheakamus River.

Lillooet (B.C.) News

MAY 30 1990

Hydro says public favors existing corridors for Kelly Lake

BC Hydro says "an option is emerging" for its proposed Kelly Lake-Cheekye transmission line.

After months of technical and environmental studies and a series of open houses in communities along the route of the line, Hydro says the existing transmission line corridor (with some alterations) appears to be the acceptable option for its 200-kilometre Kelly Lake-Cheekye 500 kilovolt line.

The route Hydro is leaning towards runs from the Kelly Lake substation near Clinton, crosses the Fraser and Bridge rivers and then traverses Mission ridge to the Shalalth area. It skirts along the edge of Anderson Lake to D'arcy and then proceeds past Birken and Green Lake before going on to Whistler and Cheekye.

Hydro has scheduled a second round of open houses next month, with meetings set for Pemberton Secondary School on Thursday, June 7; Bridge River Elementary School on Tuesday, June 12; and the Legion building in Lillooet on Wednesday, June 13. All open houses are from 4 to 8 p.m.

In its recent studies, Hydro has examined a number of options and alternatives, including using the existing Mission/Anderson/Gates segment versus a new route along the Duffey Lake Road.

A Hydro report notes that the Village of Lillooet, the Squamish-Lillooet Regional District and the Mount Currie Indian Band have all expressed their preference for the existing corridor and have asked that the Duffey Lake route be avoided.

The report says the Duffey Lake option would have a major visual effect along the scenic Duffey Lake Road and in Lillooet and Mount Currie Village, as well. Use of that route would also have a negative effect upon wildlife, forestry and recreation.

Hydro also examined the Pavilion Mountain option versus the Antoine Creek option. The studies concluded that the Antoine Creek segment crosses difficult terrain; would have a significant effect on wildlife, including bighorn sheep; and would be opposed by residents of the Yalakom Valley/Antoine Creek Valley areas.

Squamish (B.C.) Citizen
JUN -7 1990

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Hydro lines always a concern

Well, the kids from Signal Hill have spoken - and the rest of us should listen. In a junior council May 25, the young aldermen and mayor put forward the following recommendation.

"The Village of Pemberton would like no hydro transmission lines in the Village." The main concern was the proximity to Signal Hill Elementary School. For all the research, no one can say with absolute certainty that hydro lines are safe.

It was recommended by the junior council that the power lines presently running through the village should be relocated outside the village boundaries. It was also recommended that no new corridors for the main lines be made and that existing routes should be used except in the village boundaries.

This is a pretty clear message from the younger members of society. Adults need to voice their opinions just as clearly at the public meeting to be held today at Pemberton Secondary School from 4-8 p.m.

BC Hydro is proposing a second 500 kV line to run in general along existing routes from Kelly Lake to Cheekye. Residents should express their concerns and ask their questions now - before the line is built. Not only are health issues in question, but aesthetics may also be affected by the construction of a new line.

Residents will not benefit from the line - power goes directly to the Lower Mainland.

Of course no one's saying we shouldn't have power. Everyone likes heat and light and warm showers. BC Hydro has done remarkable things with their powersmart program to encourage people to use less energy. If BC Hydro can't meet demands with present lines, it may well have to build more.

What residents can do is determine where, when and how the lines are built. The lines don't have to run straight through residential neighborhoods. They can be routed outside town boundaries, and they can be located underground. There are several options.

But people *must* let BC Hydro know how they feel. If you don't attend the open house, write a letter. Because hydro lines are such a contentious issue, residents along the Kelly Lake to Cheekye corridor must respond to officials. Just do it.

Squamish (B.C.) Times
JUN. 12. 1990

Hydro fails to please Cheakamus residents

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(1) of 2

Upper Cheakamus residents have indicated they don't like any of the transmission line routes BC Hydro proposes to put through their valley.

The residents told Hydro they would rather the right of way follow a route which keeps to the east of Highway 99 and avoids the Cheakamus Valley and its communities entirely.

At a June 4 public meeting in the Brackendale Art Gallery, Hydro representatives presented possible routes of the proposed 500 kilovolt transmission line, the Crown corporation wants to use to reinforce the electric system between Kelly Lake and the Cheekye Substation.

One of a series of meetings held along the proposed route last week, the Brackendale meeting concentrated on what route the lines might take from Whistler to Squamish, particularly through the Cheakamus Valley.

Following a similar series of meetings last fall, Hydro identified sensitive areas and developed route options to attempt to find the best balance least cost, with the least inconvenience to people.

Hydro came with three route options mapped out through the Cheakamus Valley and a fourth following the mountainside east of Highway 99, which had not been fully considered yet.

Before the meeting Hydro spokesmen said they thought the South sub-option was the most acceptable route. The south sub-option is a route which followed the existing right of way past Midnight Way but veers east of the North Vancouver Outdoor School and the Squamish Indian Reserve.

The only problem the Hydro team foresaw was that the option ran past a native mythological site on the bluffs over the river. They promised to investigate the site to see if the lines could be put through without affecting the face-like rock feature which overlooks the river.

However, many Upper Cheakamus residents told Hydro that enlarging the existing right of way for the 500 kV line past their homes was unacceptable. Currently a 230 kV line is in the right of way

Upper Cheakamus resident Phil Harness said the people living in that community moved there to get away from industrialization and they have put up with enough interference from industry near their homes as it is.

"We put up with the effluent of the affluent; we get BC Rail's herbicides in our wells; suddenly, we have helicopters flying over head every day.

"That's not what we moved

Cont'd on page 2 X

Squamish Times JUN 12 1990

Possible EMF health effects concern Cheakamus residents

From page 1

here for."

Concerns with the power lines ranged from the effects of the electro magnetic fields (EMF) to the disturbances caused by constructing the right of way.

Dr. Kelly Gibney, Hydro's expert on the effects of EMF, said scientific research has not determined what the health effects of EMF are.

A cumitive link between cancer, particularly leukemia, and EMF has not been established, he said.

There are three biological effects of EMF which he said have an effect only as long as the animal, including humans, is in the field.

There is a "slight" change in the heart beat of one beat per minute which occurs when a field is switched on and off, but not in a steady flowing state.

The electric fields also create a variation in the calcium ion efflux, the implications of which are not understood. Calcium is associated with short-term memory.

The field also influences the generation of the melatonin hormone which governs sleep patterns. Gibney noted that many people, especially shift workers, live at odds with daylight hours without suffering ill effects.

The effect is similar to jet lag and people do adapt to it, he said.

However, the Cheakamus residents were not convinced of the safety of the power lines. Upper Cheakamus resident Arnaut Scherer said many companies including BC Hydro, have made promises before which have been broken. Chemicals have been "proven" safe and only later have the health effects become acknowledged.

"I don't see why we should be used as guinea pigs."

Gibney said the electrical fields fluctuate according to the current or amperage. The greater the amperage, the greater the field.

Given that the field varies with the current, he said a distribution line into a house where a lot of energy is used could give off a stronger field than a transmission line.

The electrical fields fall off very quickly and houses can shield people from them.

The magnetic fields surrounding lines have been questioned as causes of cancer. They vary with changes in voltage, which is kept constant on power lines. However, the greater the voltage on a power line, the greater the magnetic field around it will be.

Magnetic fields do not fall off as quickly as electrical ones and houses do not shelter people from their effects, Gibney said.

He stressed the fact that the effects of EMF are not conclusively understood and more research is needed to determine the effects.

"If we understood and knew what the risks are, then we could make a move as a society."

He said the problem is not just with this transmission line, but with electrical use around the world.

In an attempt to avoid confrontation with the residents, Hydro identified an eastern bypass route which would start about Daisy Lake and follow the hillsides down to just north of Brackendale where it would cross the highway to the substation.

The route would use the topography to minimize the visual impact of the line and it would be outside the proposed Garibaldi Alpen Resort.

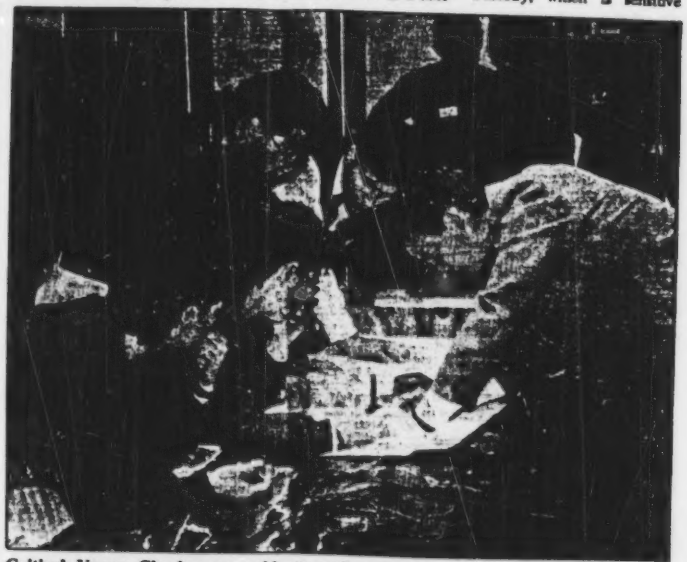
Hydro transmission line project manager Jeff Barker guessed the route might cost $4.5 million more than following the existing route.

The eastern route would require negotiations with Forestry, which is sensitive about having land alienated from the operable forest.

In the end, even if Hydro recommends the eastern bypass route, the Utilities Commission might say the utility must use the existing route and one of the sub-options through the Cheakamus Valley.

The Commission probably has final say on what route the transmission line will take, although the process is new to everyone involved, Barker said.

He said it is important that everyone concerned express themselves in writing and submit it to Hydro so Hydro can deal with the concerns and the Commission can be aware of them.



Critical Upper Cheakamus residents and property owners check over Hydro's transmission line route options. Most of the people who filled out the forms said they preferred the route which did not go through the Cheakamus Valley at all.

Lillooet (B.C.) News

JUN. 13. 1990

288 OPEN HOUSE

Lillooet residents are invited to attend a BC Hydro Open House on the Kelly Lake-Cheekye transmission line project this afternoon from 4 to 8 at the Legion Hall. BC Hydro has completed environmental and technical studies on several transmission line route options and now is seeking further public input on its proposal. An open house was held yesterday in Seton-Shalalth.

Whistler (B.C.) Question

JUN. 14. 1990

Hydro leaning toward Whistler route

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By Andy Jukes

B.C. Hydro appears to have settled on a route for its second Kelly Lake-Cheekye 500-kilovolt power transmission line, visitors to an open house last Wednesday in Whistler learned.

The second 500 kV line will, in all likelihood, replace one of the existing 230kV lines that already run down the corridor, from Kelly Lake (near Clinton) to Cheekye (north of Squamish).

However, the decision on whether the power line will be placed in the existing corridor in the immediate vicinity of Whistler or whether Hydro will choose to build a new corridor through another valley in the Whistler area remains to be made.

The turnout of interested Whistler residents was strong at the open house, which was held to provide an update on the status of the Kelly Lake-Cheekye line and to apprise Whistler residents of Hydro's findings at the previous series of open houses, held last fall.

Based on the open houses, Hydro says that a public consensus, which favors utilizing the existing power-line corridor for the new 500 kV line, is emerging.

Hydro appears to be proceeding almost entirely on the visual impact the new line would have. The utility company stands by its position that there are no long-term detrimental health effects associated with electromagnetic fields produced by high-voltage power-lines.

In the immediate Whistler area, the second route proposed is known as the Soo-Rainbow Option and would see the new power line leave the existing corridor north of Whistler at the junction of Rutherford Creek and Green River, pass into the Soo Valley, proceed west of Rainbow Mountain, pass through the lower Callaghan Valley and rejoin the existing right-of-way south of Brandywine Park.

In a report discussing the two route options, Hydro concedes that the second option would have the effect, both now and in the future, of detracting from the recreational and visual appeal of the Soo-Rainbow-Callaghan areas, while improving only minimally the views from various locations in the Whistler area.

Given that the expense of building a whole new second right-of-way would be much higher than merely running the line through the existing right-of-way, and that the second right-of-way would mean that Hydro was physically impacting on not one but two valleys in the Whistler area, the power company seems likely to decide on using the existing corridor for the 500 kV line.

Hydro has said that the second 500 kV line is necessary to meet projected power demands from the Lower Mainland and Vancouver Island by the turn of the century.

Lillooet (B.C.) News
JUL 20 1990

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Disappointing turnout at BC Hydro open house

Only 11 persons turned out last Wednesday afternoon for the BC Hydro Lillooet Open House on a proposed second 500 kV. Kelly Lake-Cheekye transmission line.

That contrasted with Seton-Shalalth, where almost 20 persons attended the open house which provided an update on preferred options and plans for the transmission line route.

"I was disapponted that we didn't have a larger turnout," said Kevin Graeme, public consultation officer on the project. He spoke with the News in a telephone interview from his Vancouver office. "A larger turnout would have made things easier to work with and go ahead."

Mr. Graeme said it was "strictly a matter of where are we at and what's next" for the people who did come out to discuss the transmission line proposals.

He said Hydro now will continue to meet with special interest groups, such as native Indian bands in this area.

"The native situation still has to be resolved," he stated, adding that the corporation and band councils are only in the "preliminary stages" of negotiations about transmission lines that cross over Indian land and compensation for those lines.

At previous open houses, the general public has expressed the wish that Hydro follow the existing transmission line corridor, rather than building lines along, for example, the Duffey Lake Road.

Engineer Billy C. Ellis, Hydro's Project Planning Coordinator, was one member of the team visiting Lillooet for last Wednesday's open house.

He explained Hydro first had to conduct environmental and engineering studies to determine the conditions under which the project is environmentally and technically feasible. Once a decision has been made on the design and routing and once the need for the project has been confirmed, BC Hydro will apply for an Energy Project Certificate to the Minister of Energy, Mines and Petroleum Resources requesting approval to construct the project.

Mr. Ellis told the News BC Hydro hopes to have the transmission line in service as early as the fall of 1995. The proposed Kelly Lake to Cheekye line would improve the reliability of supply to both the Lower Mainland and Vancouver Island.

BC Hydro engineer Billy Ellis points out a transmission lir route option at last week's open house in the Legio basement. Only 11 people attended the Lillooet open house.

Squamish (B.C.) Chizen
JUL 28 1990

Powerline health risks must be considered

Dear Editor:

The likely decision that B.C. Hydro will choose the existing corridor for their new 500-kilovolt power transmission line is a decision that should not be taken lightly, especially by the residents of Tapley's Farm.

Of course B.C. Hydro stands by its position that there are no long term detrimental effects associated with electromagnetic fields produced by high voltage powerlines. To the contrary there is growing concern and evidence that there is the risk of leukemia and other cancers when there is exposure to electromagnetic fields. Recent studies done by the Environmental Protection Agency in the U.S. support the results of childhood cancer studies which show links between the development of leukemia and the presence of hydro lines. Whose interests are at stake here?

The existing power lines already run dangerously close to residences in this area and I for one don't want to see the chances of our children developing leukemia doubled by the introduction of twice the number of kilovolts running through this area.

The visual impact created by a new line is to be considered but must we put the health of ourselves and our children in jeopardy in order to meet the projected power needs of the Lower Mainland and Vancouver Island.

Sincerely,
Trish Fennell
Whistler

Squamish (B.C.) Citizen
JUL 12 1990

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Three options for Whistler sewage

By Stephen Forgacs

Discharge effluent into the Cheakamus River, the Squamish River, or use a process called ground infiltration. These choices were presented to Whistler council as final options for dealing with Whistler's future sewage requirements.

Of six plans initially developed, the three above were advanced to "stage 2" for further evaluation, Brian Walker of Dayton and Knight Ltd., consultants hired by the municipality, told a small audience and council at a public information meeting Monday.

Plan One involves expansion of the existing sewage treatment plant with added filtration to reduce phosphorous levels, and discharge of effluent into Cheakamus River.

The control of phosphorous levels is an important consideration in this plan as there is a link between increased phosphorous levels and increased algae growth. Algae is primarily an aesthetic problem since it covers submerged rocks making them green and slippery.

Implementation of the plan would take about four years and cost about $14,630,000. Operating and maintenance costs are estimated at $810,000 per year.

Plan Two involves expansion of the existing treatment plant, piping the effluent to the B.C. Hydro tunnel entrance at Daisy Lake, and then effluent discharge to the Squamish River.

B.C. Hydro has agreed in principle to the effluent pipeline although certain "effluent quality standards" must be met.

The cost of the plan would be about $29,100,000 and operating and maintenance costs are projected at $1,290,000 per year. Implementation would take three years.

Plan Five involves expansion of the existing plant and discharge of effluent into "ground infiltration basins." Plan Five relied solely on ground infiltration and it was found that the area to be used was not big enough to deal with the effluent generated in one year of full use. Therefore, a Plan 5-A was developed.

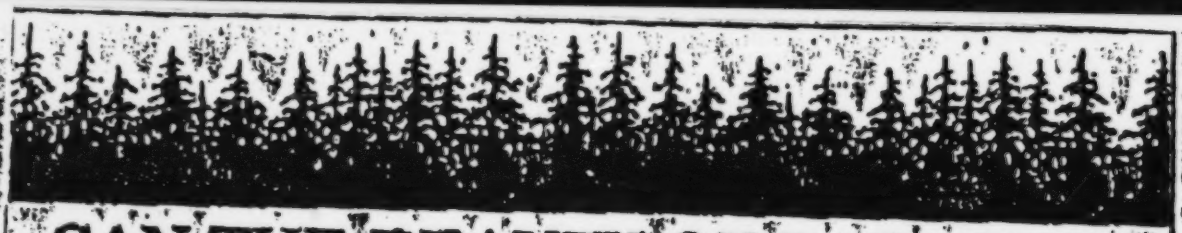
Plan 5-A involves the discharge of effluent into infiltration basins from May 15 to Sept. 15 and into the Cheakamus River for the rest of the year. Walker said a land area of about five times the existing area would be required if ground infiltration was to be used all year.

A limitation to this plan is that there may be a 20-year limitation to its use given the amount of land available.

Cost of implementation would be about $14 million and annual operating and maintenance costs are projected at about $1 million. Implementation would take three years.

Each plan is reviewed by a Technical Review Committee comprised of representatives from the Ministries of the Environment and Health, Environment Canada, Fisheries and Oceans, the Squamish-Lillooet Regional District and the Resort Municipality of Whistler.

The final plan must be passed by council and approved by the provincial government.



CAN THE BEAUTY OF PARADISE VALLEY BE REGAINED?

..... YES ! ! .....

With Your Support

In 1947 a 230kV power line cut Paradise Valley into a northern and a southern half. By 1992 B.C. Hydro (wishing to expand its service) may clearcut a significant strip of forested land parallel to the existing easement and install a 500 kV line along 150'-high pylons.

Paradise Valley belongs to the District of Squamish. More than 10,000 people cannot be wrong in calling the view into Paradise Valley and the Tantalus Mountain Range one of the most magnificent in all British Columbia.

There is an alternative to B.C. Hydro's proposed Paradise Valley route: namely, high above Whistler Highway, out of sight from any viewpoints. This alternative route would also eliminate the electromagnetic health hazard to the residents of Paradise Valley.

Please support your fellow citizens in Upper Cheakamus in their determination to regain a healthy, unobstructed environment, free of electromagnetic fields. Complete the petition form below and mail it to one of the addressees provided:

1) Upper Cheakamus Residents Group
c/o Peter Varga
P.O. Box 487
Brackendale, B.C.
V0N 1T0

2) Mr. K.C. Graeme
Public Relations Office
B.C. Hyrdro
970 Burrard Street
Vancouver, B.C. V6Z 1Y3

YES, I wish to support my fellow citizens in Upper Cheakamus in their determination to locate the proposed 500kV power line well outside Paradise Valley!

Name: _____

Address: _____

_____ Postal Code: _____

Signature: _____ Date: _____

Your written support can greatly influence the final decision by B.C. Hydro.

Thank you for consideration and goodwill.

Lillooet (B.C.) News

SEP. -5. 1990

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Council received a communication from BC Hydro which requested their input into the review process for the proposed Kelly Lake-Cheekeye 500kV transmission line.

Approval was expressed by Council members that the favored route for the power line is through already existing power transmission corridors, and it was decided to discuss the proposals received from BC Hydro at the next Council meeting on Sept. 24.

XX

KELLY LAKE–CHEEKYE PROJECT
PHASE 1
CHRONOLOGY OF MEETINGS

May 10/89 Squamish District Office	Purpose To provide information about the Kelly Lake-Cheekye project proposal to Hydro employees.
	Attendees Project Team: M.Algar, B.Ellis, B.Hooper, S.McCarthy District Office staff
	Key Issues 1) Employees anticipate opposition to the proposal to be strongest in Whistler and Pemberton 2) Concern that the line would be needed for power export

May 17/89 Squamish Council Chambers	Purpose To provide project information to study area Mayors and the Squamish-Lillooet Regional District Chairman
	Attendees B.C.Hydro: M.Algar, J.Barker, C.Boatman, A.Svendsen (Synergistics) Elected Officials: S.L.R.D.Chairman–D.Cumming, Pemberton Mayor–S. Henry, Squamish Mayor–P.Turner, Whistler Mayor–D.Meredith.
	Key Issues 1) Potential impacts from EMFs, herbicides; visual impacts. 2) Specific concerns about routing especially through the communities. 3) Need to compensate impacted communities.

May 24/89 Bridge River Hydro Office, Shalalth	Purpose To provide project information to Hydro employees.
	Attendees Project Team: M.Algar, B.Ellis, B.Hooper, S.McCarthy (Synergistics) Production Office staff
	Key Issues 1) Recognize unresolved Native issues. 2) Interested in employment opportunities and upgrading of the Highline Road 3) Feel previous public consultation program was inadequate.

June 12/89 Kamloops District Office	Purpose To provide project information to Hydro employees.
	Attendees Project Team: M.Algar, B.Ellis, B.Hooper, S.McCarthy (Synergistics) District Office staff
	Key Issues 1) Employees anticipate difficulties in Whistler and with Native bands. 2) Questions re: costs of various alternatives. 3) Questions re: Hydro's system plans for the future.

June 13/89 Cache Creek Production Office	Purpose To provide project information to Hydro employees.
	Attendees Project Team: M.Algar, B.Ellis, B.Hooper, S.McCarthy (Synergistics) Production Office staff.
	Key Issues 1) Questions about power exports, Hydro's system plans for the future and costs of various alternatives.

June 13/89 Squamish Council Chambers	Purpose To provide project information to Squamish Council.
	Attendees Project Team: M.Algar, J.Barker, B.Ellis, K.Farquharson, A.Svendsen (Synergistics) Squamish Council: W.Barr, Alderperson: W.Bloxham, Clerk Administrator; B.Gilles, Alderperson; C.Harvey, Alderperson; E.Lonsdale, Alderperson; R.McCreedy, Alderperson; J.Payne, Director of Public Works; B.Sims, Deputy Clerk; P. Turner, Mayor; L.Wilbur, Alderperson.
	Key Issues 1) Perceived inequity,ie. Squamish would bear costs yet realize few benefits. 2) Visual impact and viability of underground lines. 3) Anticipate opposition to Duffey, Soo, and Callaghan route options.

June 20/89 Clinton Council Chambers	Purpose To provide project information to Clinton Council members.
	Attendees Project Team: M.Algar, B.Ellis, K.Farquharson, A.Svendsen (Synergistics) Clinton Council: D.Long, Mayor; Y.Porada, Clerk Administrator; M.Sorenson. Alderperson.
	Key Issues 1) Concern about EMF impacts. 2) Interested in employment opportunities and construction impacts. 3) Questions about Hat Creek development.

June 20/89 Lillooet Council Chambers	Purpose To provide project information to Lillooet Council members.
	Attendees Project Team: M.Algar, B.Ellis, K.Farquharson, A.Svendsen (Synergistics) Lillooet Council: R.MacLelan,Treasurer; R.Watson, Clerk Administrator; D.Wheeldon, Alderperson; J.Willey, Alderperson.
	Key Issues 1) Support for the existing ROW and opposition to use of the Duffey route option. 2) Questions about Meager Creek development. 3) Feel area residents bear the costs of such energy developments.

June 26/89 Pemberton Council Chambers	Purpose To provide project information to Squamish-Lillooet Regional District Board members.
	Attendees B.C.Hydro:M.Algar, J.Barker, B.Ellis, K.Farquharson, B.McNeney, A.Svendsen (Synergistics), T.Thompson. SLRD Board members
	Key Issues 1) Opposition to Duffey route option and ,in general, to placing a new line through wilderness areas. 2) Opposition to development of major energy projects for export. 3) Concern about impacts of herbicides. 4) Birkenhead/Anderson Lake residents have borne the costs of too many transmission lines. 5) Regional inequity issue associated with residents living along the existing ROW who have no power.

June 26/89 Whistler Council Chambers	Purpose To provide project information to Whistler Council members.
	Attendees B.C.Hydro: M.Algar, J.Barker, B.Ellis, K.Farquharson, B.McNeney, A.Svendsen (Synergistics), T.Thompson. Whistler Council: P.Burrows, Alderperson; T.Johnstone, Alderperson; D.Meredith, Mayor; T.Nebbling, Alderperson; H.O'Reilly, Alderperson; T.Rodger, Alderperson; N.Wilhem-Morden,Alderperson.
	Key Issues 1) Type of visual impact analysis that will be done. 2) Preference for existing corridor as opposed to the Soo or Callaghan options. 3) Perception that local residents have borne the costs of too many lines already. 4) Questions about routing, tower type and size.

August 1/89 Squamish Council Chambers	Purpose To provide information about independent power projects.
	Attendees B.C.Hydro: M.Algar, J.Barker, W.Morgan, B.McNeney, D.Schwenning Squamish Council: R.Barr, Alderperson; B.Bloxham, Clerk Administrator; B.Giles, Alderperson; C.Harvey, Acting Mayor; C.Lonsdale, Alderperson; J.Payne, Public Works.
	Key Issues 1) Feel District of Squamish has been inundated with proposals for transmission lines and IPPs. 2) Revisions should be made to the review process to permit earlier involvement of municipalities. 3) Provincial Government should have a role in advising communities about proposed IPPs. 4) Concern about impact of IPPs on municipal water resources. 5) Projects outside District boundaries should be referred to it for comment if there is any possibility of impact upon the District.

Sept.25/89 Lillooet Council Chambers	Purpose To update the Board on the Kelly Lake-Cheekye project and make a presentation on EMFs.
	Attendees B.C.Hydro: M.Algar, J.Barker, K.Cooke (Synergistics), K.Gibney. SLRD Board members.
	Key Issues 1) Queries about the potential for human health effects from EMFs. 2) Support for use of the existing corridor; opposition to the use of Duffey.

Nov.30/89 Moha Community Hall	Purpose To hear the concerns of the Yalakom/Antoine Creek residents about the proposed project.
	Attendees B.C.Hydro: P.Christie (Talisman), J.Edwards, B.Ellis. Thirty six local residents.
	Key Issues 1) Adamant opposition to the proposal. 2) Hydro needs to negotiate with Native people. 3) Concern about health effects from herbicides and EMFs. 4) Want to protect the valley from development; prepared to fight Hydro if a decision is made to build down the Antoine route.

October 3/89 Clinton Community Hall	Purpose To hold an Open House to provide project information to and seek input from local residents.
	Attendees Project Team: M.Algar, K.Cooke (Synergistics), B.Ellis, B.Hooper, S.McCarthy (Synergistics), B.Tong (Synergistics). Twenty nine local residents.
	Key Issues 1) Hope that project would create local economic benefits. 2) Health risks from EMFs and herbicides.

October 4/89 Shalalth	Purpose To meet with members of the local Chamber of Commerce to discuss the project
	Attendees Project team: M.Algar, B.Ellis, B.Hooper, K. Farquharson Seton/Shalalth Chamber of Commerce: B.Henshaw, N. Coyle
	Key Issues 1) Discussion about upgrading Highline Road and creating local park on Hydro land

October 4/89 Bridge River School, Seton–Shalalth	Purpose See October 3/89 above.
	Attendees Project Team: see Oct.3 above and K.Farquharson. Twenty six local residents.
	Key Issues 1) Desire to see Highline Road upgraded, in conjunction with project construction. 2) Feel Hydro should compensate communities that bear the costs of transmissiom line development.

October 5/89 Lillooet Community Hall	Purpose See Oct.3 above.
	Attendees Project Team: See Oct.4 above. Fifty six local resident
	Key Issues 1) Protect wilderness areas; keep new lines in existing corridor. 2) Opposition to use of the Duffey route option. 3) Potential risks to health from EMFs and herbicides. 4) Desire for local economic benefits.

October 10/89 Seton Lake Band Hall	Purpose See Oct 3 above.
	Attendees Project Team: B.Ellis, K.Farquharson, B.Hooper. Fifteen band members.
	Key Issues 1) Desire to discuss specific resource issues with Hydro's environmental consultants. 2) Concern that new ROW development will further expose traditional land uses to intrusion. 3) Support for upgrading of the Highline Road.

October 11/89 Pemberton Municipal Hall	Purpose See Oct 3 above.
	Attendees Project Team: see Oct 4 above and K.Gibney. Twenty nine local residents.
	Key Issues 1) Justification and power export. 2) Potential for health effects from EMFs and herbicides. 3) Effects on land use, especially agriculture. 4) Concern over safety of PCB storage at Creekside.

October 12/89 Pemberton	Purpose To meet with concerned parents to discuss EMF effects
	Attendees Project Team: K.Gibney Signal Hill Parent's Group Representatives
	Key Issues 1) Proximity of 2L1 and 2L2 to school 2) EMF effects 3) Justification and electricity export

October 12/89 Blackwater Creek Elem. School, Birken	Purpose See Oct 3 above.
	Attendees Project Team: see Oct 11 above. Fifty two local residents.
	Key Issues 1) High level of concern about EMF effects. 2) Concern about impacts on property values and visual resources. 3) Communities in the valley have had to put up with too many lines; Duffey should be considered a viable alternative. 4) Opposition to export of energy.

October 13/89 Brackendale Art Gallery, Squamish	Purpose See Oct 3 above.
	Attendees Project Team: see Oct 11 above and J.Barker. Sixty three local residents.
	Key Issues 1) Concern about effects of EMFs and herbicides. 2) Effects on property values and land use. 3) Project justification and long range plans for further transmission development in the Kelly Lake-Cheekye corridor. 4) Adverse visual impacts. 5) Benefits for impacted communities.

October 14/89 Myrtle Phillips Elem School, Whistler	Purpose To meet with interested individuals to discuss the proposed project
	Attendees Project Team Whistler residents
	Key Issues 1) Development pressure in Whistler 2) Other general concerns such as EMF effects, herbicides

October 14/89 Myrtle Philip Elementary School, Whistler	Purpose See Oct 3 above.
	Attendees Project Team: see Oct 13 above. Twenty seven local residents.
	Key Issues 1) Visual impacts in a resort town. 2) Potential health effects from EMFs and herbicides. 3) Project justification, power export and conservation. 4) Implications of IPPs for Kelly Lake-Cheekye project.

Nov. 14/89 Victoria	Purpose To give a presentation on routing options to Provincial Ministries.
	Attendees Project Team: J.Barker, J.Edwards, K.Farquharson Ministries: S.Barker, L.Berg, D.Mullen, P.Ostergaard, J.Rucki, G.Scott, P.Shera,N.Smith
	Key Issues 1) Existing ROW preferred. 2) Duffey, Antoine, Birkenhead, Ryan options should be avoided. 3) EMF, Native reserves, justification and land uses are main concerns.

Nov.30/89 Moha Community Hall	Purpose To hear the concerns of the Yalakom/Antoine Creek residents about the proposed project.
	Attendees B.C.Hydro: P.Christie (Talisman), J.Edwards, B.Ellis. Thirty six local residents.
	Key Issues 1) Adamant opposition to the proposal. 2) Hydro needs to negotiate with Native people. 3) Concern about health effects from herbicides and EMFs. 4) Want to protect the valley from development; prepared to fight Hydro if a decision is made to build down the Antoine route.

KELLY LAKE-CHEEKYE PROJECT
PHASE 2
CHRONOLOGY OF MEETINGS

June 4/90 North Van. Outdoor School	Purpose To obtain feedback about a proposed route alternative (the southern by-pass) that would remove transmission lines from the school property.
	Attendees Project Team: J.Barker, K.Cooke (Synergistics), K.Farquharson, K.Gibney. NVOS: P.Bell,Assistant Superintendent of Schools, North Vancouver; V.Elderton,Principal, C.Halvorsen,Property Manager. Squamish Band: Dick Williams.
	Key Issues 1) NVOS and Band very supportive of route option that would remove 2L1 from their properties. 2) NVOS and Band require information packages. 3) Exact location of Band mythological site "Wountie" must be determined prior to finalizing route alignments.

June 4/90 Squamish District Office	Purpose To update employees about the project.
	Attendees K.Graeme, B.Swift, five staff.
	Key Issues No specific issues; general project-related questions.

June 4/90 Brackendale Art Gallery, Squamish	Purpose To hold an Open House to report back to local residents to inform them of the results of the first phase of consultation and to obtain their views about the proposed route.
	Attendees Project Team: M.Algar, J.Barker, K.Cooke (Synergistics), B.Ellis, K.Farquharson, K.Gibney, K.Graeme,B.Hooper, L.Ratzlaff, L.Rollins. Fifty six local residents.
	Key Issues 1) Perceived potential for health effects from EMFs. 2) Loss of privacy and rural lifestyles. 3) Effects on property values and visual resources. 4) Alienation of prime developable land. 5) Importance of maintaining wilderness values.

June 4/90 Brackendale Art Gallery, Squamish	Purpose To discuss with residents in the area of the Lower Cheakamus the optional routes identified and to discuss routing preferences/concerns and address questions.
	Attendees B.C. Hydro: M.Algar,J.Barker,B.Ellis,K.Farquharson,K.Gibney, K.Graeme, L.Ratzlaff, L.Rollins Thirty-two local area residents, including Mayor Phil Turner, Alderpersons Lonsdale and Giles and press representative M. Mooney
	Key Issues 1) Concern about EMF effects 2) Support for High Cheakamus route and desire to meet with Hydro after this route study completed

June 5/90 Cheekye Substation, Squamish	Purpose To update employees about the Kelly Lake–Cheekye project
	Attendees K.Graeme, K.Gibney Fourteen production employees
	Key Issues 1) EMF effects on Hydro workers 2) General questions about the project

June 5/90 Birkenhead Lodge, Birken	Purpose To hold a Phase 2 Open House to inform local residents of the results of the first phase of consultation and to obtain their views about the proposed route.
	Attendees Project team: B. Ellis, K.Farquharson, K.Gibney, K.Graeme, B.Hooper, L.Rollins, K.Cooke(Synergistics) Thirty-two local residents
	Key Issues 1) possible realignment of new line higher up the ridge to reduced visual impact 2) support for proposed alignment and the release of the 2L1 ROW 3) desire to protect valuable developable land on the valley floor 4) health effects from EMFs 5) impacts on property values and visual impacts

June 6/90 Birken	Purpose To drive the length of the Birken Valley and assess whether the proposed alignment for the new 500 kV line could be improved to minimize visual impacts
	Attendees B.C Hydro: K.Farquharson, K.Graeme, B.Hooper Local residents: V.Bunt, S.Gimse, M&S.Moorhouse
	Key Issues 1) Two residents agreed that original planned alignment was best choice

June 6/90 Whistler Conference Centre, Whistler	Purpose To hold a Phase 2 Open House to inform local residents of the results of the first phase of consultation and to obtain their views about the proposed route
	Attendees B.C. Hydro: M.Algar, J.Barker, B.Ellis, K.Farquharson, K.Gibney, K.Graeme, B.Hooper, L.Ratzlaff, K.Cooke (Synergistics) Thirty local residents
	Key Issues 1) the need to reduce visual impacts insofar as possible 2) health effects from EMFs 3) to protect existing wilderness 4) adverse impacts on property values

June 7/90 Whistler	Purpose To investigate potential changes in alignment of the new line, as suggested by a local resident
	Attendees B.C Hydro: K.Farquharson, K.Graeme, B.Hooper Local residents: B.Allen, L.Featherstonhaugh
	Key Issues 1) Hydro to investigate two new route options in response to local property owner's concerns

June 7/90 Pemberton Sr Secondary School, Pemberton	Purpose To review the status of the project, and address concerns regarding potential EMF effects, with the Parents Group
	Attendees B.C.Hydro: B.Ellis,K.Gibney,K.Graeme Signal Hill Elementary School Parent's Group: M.Davies, C.Einarson, B.McLeod, S.Tschopp, I.Kent(Principal)
	Key Issues 1) Would like 2L2 removed from area near school 2) Oppose routing new line through valley floor 3) Concern about EMF effects

June 7/90 Pemberton Sr Secondary School, Pemberton	Purpose To hold a Phase 2 Open House to inform local residents of the results of the first phase of consultation and to obtain their views about the proposed route
	Attendees B.C. Hydro: B.Ellis, K.Farquharson, K.Gibney, K.Graeme, B.Hooper, L.Rollins, K.Cooke (Synergistics) Forty-one local residents
	Key Issues 1) the desire to move the existing lines and possibly the substation as well to free up valuable developable land 2) lines should be consolidated and kept out of pristine areas so as to preserve the remaining wilderness 3) perceived potential health effects from EMFs, especially for children at the local elementary school which is close to 2L2

June 11/90 Cache Creek District Office	Purpose To update the District Office employees about the Kelly Lake-Cheekye project
	Attendees K.Graeme,L.Devlin,A.Pasowisty,P.Slemko,T.Thompson,C.Wale
	Key Issues No outstanding concerns; general questions about the project

June 11/90 Clinton Community Hall	Purpose To hold a Phase 2 Open House to inform local residents of the results of the first phase of consultation and to obtain their views about the proposed route
	Attendees B.C.Hydro: K.Cooke(Synergistics), B.Ellis, K.Farquharson,K.Graeme, B.Hooper Seven local residents
	Key Issues 1) Few outstanding concerns 2) Interest in local employment opportunities

June 12/90 Bridge River School, Seton-Portage Shalalth	Purpose To hold a Phase 2 Open House to inform local residents of the results of the first phase of consultation and to obtain their views about the proposed route
	Attendees B.C.Hydro: J.Barker, B.Ellis, K.Farquharson, K.Graeme, B.Hooper, K.Cooke(Synergistics) Eighteen local residents
	Key Issues 1) Preference for the existing ROW along most of the route 2) Environmental preservation is high priority 3) Hope that project construction would result in the upgrading of the Highline road and that its maintenance would be taken over by the government

June 13/90 Lillooet District Office	Purpose To update employees about the Kelly Lake-Cheekye project
	Attendees K. Graeme, L.Goodey, R.Kane, A.Beckett, (line crew unable to attend)
	Key Issues 1) Concerns about state of negotiations with natives 2) General project-related questions

June 13/90 Legion Hall Lillooet	Purpose To hold a Phase 2 Open House to inform local residents of the results of the first phase of consultation and to obtain their views about the proposed route
	Attendees B.C. Hydro: J.Barker, B.Ellis, K.Farquharson, K.Graeme, B.Hooper, K.Cooke(Synergistics)
	Key Issues 1) Desire to receive up to date information about EMF effects 2) Support for the use of the existing ROW to preserve wilderness areas

August 13/90 Moha Community Hall	Purpose To inform local residents about route studies related to routes that do not cross Native reserves and to obtain their responses to these proposals
	Attendees B.C.Hydro: K.Farquharson, K.Graeme Fifty local residents
	Key Issues 1) Residents reiterated their absolute opposition to transmission lines through the Yalokom/Antoine Creek Valleys 2) Feel Hydro should deal with Natives even if this jeopardizes project schedule 3) Concerns about EMFs, impacts on environment

October 11/90 Victoria	Purpose To update MEMPR on project
	Attendees B.C.Hydro: J.Barker, J.Edwards MEMPR: D.Mullen, P.Ostergaard
	Key Issues 1) Discussion about regulations reviewed 2) Discussion about B.C. Hydro's plans for EPC Application.

C.W.J. Boatman
V.P. Corporate and Environmental
Affairs & Executive Assistant
to the Chairman
(604) 663-3383

B.C. Hydro
Proud of our Service.

6 July 1989

Dear MP/MLA:

I am writing to inform you of B.C. Hydro's plans to study a proposed second 500 kV transmission line between the Kelly Lake Substation near Clinton and the Cheekye Substation near Squamish.

As you may recall, this project was reviewed in the early 1980's but was subsequently deferred due to declining power demands. Forecasts of current power demands indicate that the second line is now required to ensure a reliable supply of power to our Lower Mainland and Vancouver Island customers.

Our preliminary studies are aimed at collecting engineering, environmental and socio-economic information on which to base an application for an Energy Project Certificate.

We would be pleased to meet with you to discuss the project and our proposed public consultation process. I have asked Jack Edwards, our External Relations Manager, to arrange a convenient meeting time and address any questions that you might have in the interim regarding the project.

Yours truly,

ORIGINAL SIGNED BY
C. W. J. BOATMAN

C.W.J. Boatman

c: Honourable Jack Davis
Minister of Energy, Mines
and Petroleum Resources

B.C. Hydro

25 July 1989

File: 5L46-1400

Dear Squamish Lillooet Regional District:

I would like to thank the members of your council for the opportunity to present our plans for the proposed Kelly Lake to Cheekye 500 kV transmission line at your council meeting of 26 June 1989.

I have enclosed a package of published material on the subject of electric and magnetic field effects of transmission lines. Should you require further information after your review of this material, please let us know.

Thank you once again for meeting with our project team. We look forward to you involvement in the design and implementation of our consultation program for the Kelly Lake-Cheekye project. If you have any further question or concerns, do not hesitate to contact myself at 663-4014 or Mary Algar, our External Relations Coordinator, at 663-3796.

Yours very truly,

J. (Jeff) Barker, P.Eng.
Project Manager

JB/wpc
Enclosures

VL195

B.C.Hydro

25 July 1989

File: 5L46-1400

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Yours very truly,

J. (Jeff) Barker, P.Eng.
Project Manager

JB/wpc
Enclosures

VL195

BCHydro

proud of our Service

4 January 1990

Dear MP/MLA:

Re: Kelly Lake-Cheekye Transmission Line

We would like to take this opportunity to provide you with an update of the progress on our studies and our plans for the new year. A progress report is attached for your reference.

Based on the concerns raised during our public consultation process, we will be continuing the technical and environmental studies, and identifying possible route options. It is our intention to publicly review these options in early 1990.

We remain committed to involving the constituents of this area in Hydro's projects and programs. We would be happy to address any specific concerns or questions relating to the studies currently underway. Please contact myself at 663-2653 or the Manager of External Relations, Jack Edwards, at 663-3795 if you require further assistance.

Yours truly,

ORIGINAL SIGNED BY T. THOMPSON

L.D. Perkins for

Thom M. Thompson
Manager
Government and Public Affairs

cc: M. R. Algar
K. Graeme

VL270

KELLY LAKE - CHEEKYE TRANSMISSION LINE PROJECT

PROGRESS REPORT

In May of 1989, B. C. Hydro initiated a planning and development program to investigate a second 500 kV transmission line between Cheekye Substation (near Squamish) and Kelly Lake Substation (near Clinton). This summary highlights our progress to date and current plans for completion of our studies.

PROGRESS TO DATE

May

- Established a project team consisting of Hydro staff and independent consultants to investigate technical, environmental and public consultation matters.
- Briefed Mayors of Municipal Councils and Regional District Chairman on project proposal.
- Contacted provincial government staff for project information.
- Initiated technical and environmental studies.

July

- Completed community profiles of Clinton, Seton/Shalath, Birken/D'Arcy/Gates Lake, Pemberton, Whistler and Squamish.
- Interviewed local residents (approximately 70).

August

- Interest group meetings were held.

September

- Met with Squamish Lillooet Regional District Board to provide project update.
- Distributed first Newsletter to every household in the region.
- Letters and notice of "Open Houses" were sent to Bands and Tribal Councils within the study area.

October

- Held "Open Houses" at eight separate communities: Clinton, Seton/Shabalth, Lillooet, Seton Lake Indian Reserve, Pemberton, Birken, Squamish and Whistler.

- Met with some of the Bands.

December

- Internal review of preliminary environmental, technical and public consultation study results.

CURRENT PLANS FOR STUDY COMPLETION

January

- Internal review of project route options based on environmental, technical and public consultation.

February

- Distribute second newsletter and interim project report.

- Meetings with Provincial, Municipal and Regional government agencies and officials.

March

- Further Public Consultation meetings.

April

- Internal review of outstanding issues and concerns.

May

- Submit application to Ministry of Energy, Mines & Petroleum Resources.

BC Hydro

proud of our Service

J.C. Edwards
Manager, External Relations
(604) 663-3795
Fax (604) 663-3323

5 January 1990

_____
_____
_____
_____

Dear _____:

Re: Kelly Lake - Cheekye 500 kV Transmission Line

We are writing to you as one of the groups, agencies, and individuals who have been involved in some way in our public consultation program for the proposed Kelly Lake - Cheekye Transmission Line project. We appreciate the interest you have shown to date and the comments and concerns that were raised during our planning studies. I have attached a progress report of our consultation program to this date.

The project team is now incorporating your comments and ideas, along with the results of environmental and technical studies, into their review of transmission line route options.

We intend to have further public consultation in the new year and would hope to have your continued involvement.

If you would like to discuss any specific concerns in the meantime, please contact our recently appointed project public consultation officer, Kevin Graeme, collect at 663-3414, or call our toll-free project information line 1-800-663-1377.

Thank you again for your interest.

Yours truly,

J. C. Edwards
Manager
External Relations

Attachment

cc: K. C. Graeme

VL259A

KELLY LAKE - CHEEKYE TRANSMISSION LINE PROJECT

PROGRESS REPORT

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- Submit application to Ministry of Energy, Mines & Petroleum Resources.

Pemberton and District Public Library
Box 430
Pemberton, B. C.
VON 2LO

Squamish Public Library
Box 1039
Squamish, B. C.
VON 3GO

Cariboo-Thompson Nicola Library System
Bralorne-Gold Bridge Branch
General Delivery
Gold Bridge, B. C.
VOK 1PO

Cariboo-Thompson Nicola Library System
Box 550
Clinton Branch
Clinton, B. C.
VOK 1KO

Cariboo-Thompson Nicola Library System
Box 939
Lillooet Branch
Lillooet, B. C.
VOK 1VO

Yalecom Ecological Society
Box 99
Lillooet, B. C.
VOK 1VO

Hayashi Resources
Box 106
Pemberton, B. C.
VON 2LO

Mr. Peter Alder
Box 62
Whistler, B. C.
VON 1BO

C. Allan
Jesmond Road
Clinton, B. C.
VOK 1KO

Cariboo-Thompson Nicola Library System
Cache Creek Branch
Cache Creek, B. C.
VOK 1HO

VL283A

BC Hydro

proud of our Service

J.C. Edwards
Manager, External Relations
(604) 663-3795
Fax (604) 663-3323

26 January 1990

Dear Sir/Madam: - General Public Mail Out

RE: KELLY LAKE - CHEEKYE 500 kV TRANSMISSION LINE

We are writing to you as one of the groups, agencies, and individuals who have been involved in some way in our public consultation program for the proposed Kelly Lake - Cheekye Transmission Line project. We appreciate the interest you have shown to date and the comments and concerns that were raised during our planning studies. I have attached a progress report of our consultation program to this date.

The project team is now incorporating your comments and ideas, along with the results of environmental and technical studies, into their review of transmission line route options.

We intend to have further public consultation later in the year and would hope to have your continued involvement.

If you would like to discuss any specific concerns in the meantime, please contact our recently appointed project public consultation officer, Kevin Graeme, collect at 663-3414, or call our toll-free project information line 1-800-663-1377.

Thank you again for your interest.

Yours truly,

ORIGINAL SIGNED BY
J.C. EDWARDS

J. C. Edwards
Manager
External Relations

Attachment
cc: K. C. Graeme

BC hydro

proud of our Service

Ken G. Farquharson
Contact: 663-1878
Environmental Resources
Fax: (604) 663-4102

31 January 1990
FILE: 5L046-200.0(1)

Dear B.C. Wildlife Federation:

Re: Kelly Lake Cheekye 500kV Transmission Line

The environmental and public consultation work for this project continues with the objective of submission of an application to government for an Energy Project Certificate in May 1990.

To date there is no record of the opinion of your organization on the route options for this project. Given your mandate and interests it would be greatly appreciated if you would advise us of any concerns or recommendation your organization may have regarding the project.

Of particular interest to B.C. Hydro would be your opinion on the following points:

1. It is your preference the project use the existing transmission line corridor, or not?

2. If alternate route options to the corridor were used, what is your option on the relative merits of the following?

   a) Use of Antoine segment (BG) versus use of Pavilion Mission segment (BCEFG).

   b) Use of existing corridor along Anderson Lake (FGHJ) versus use of Duffey corridor (FJ).

   c) Use of Birkenhead/Owl segments (HIK) versus use of existing corridor (HJK).

   d) Use of Birkenhead/Ryan/Rainbow segments (HI MN) versus use of existing corridor (HJKLN).

e) Use of Soo/Rainbow segments (LMN) versus existing corridor through Whistler (LN).

Please reply to me at the address shown.

Yours truly,

K.G. Farquharson.

Ken G. Farquharson

KGF/jc

cc: K. Graeme, Extenal Relations

BC hydro

proud of our Service

Ken G. Farquharson
Contact: 663-1878
Environmental Resources
Fax: (604) 663-4102

31 January 1990
FILE: 5L046-200.0(1)

Dear Federation of Mountain Clubs of B.C.:

Re: Kelly Lake Cheekye 500kV Transmission Line

The environmental and public consultation work for this project continues with the objective of submission of an application to government for an Energy Project Certificate in May 1990.

To date there is no record of the opinion of your organization on the route options for this project. Given your mandate and interests it would be greatly appreciated if you would advise us of any concerns or recommendation your organization may have regarding the project.

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Yours truly,

K.G. Farquharson.

Ken G. Farquharson

KGF/jc

cc: K. Graeme, Extenal Relations

BCHydro

proud of our Service

1 June 1990

Dear MP/MLA:

Kelly Lake - Cheekye 500 kV Transmission Line Project

I am writing to inform you of our recent progress and plans regarding the proposed 500 kV transmission line between Kelly Lake Substation and Cheekye Substation.

Our second project newsletter which summarizes public concerns and comments, along with a summary of environmental and technical studies has been enclosed for your reference. A more detailed planning report will be forwarded as soon as it is available.

Members of the project team will be returning to the area to present these findings to the public in Open Houses at the following locations:

Monday	4 June	* Brackendale Art Gallery Government Road, Squamish
Tuesday	5 June	* Birkenhead Lodge Portage Road, Birken
Wednesday	6 June	* Conference Centre Whistler Way, Whistler
Thursday	7 June	* Pemberton Senior Secondary School Pemberton Meadows Road, Pemberton
Monday	11 June	* Clinton Community Hall 306 LaBourdais Avenue, Clinton
Tuesday	12 June	* Bridge River School Mission Mountain Road, Seton Portage/Shalalth
Wednesday	13 June	* Legion Hall 737 Main Street, Lillooet

I will continue to keep you apprised of the status of this project. Should you have any questions please contact myself (collect) at 663-2653 or Jack Edwards, our Manager of External Relations (collect) at 663-3795.

Yours truly,

ORIGINAL SIGNED BY
T. THOMPSON

Thom M. Thompson
Manager
Government and Public Affairs

c: Honourable Jack Davis
J.C. Edwards

BCHydro

proud of our Service

1 June 1990

Dear Squamish Lillooet Regional District:

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ORIGINAL SIGNED BY
T. THOMPSON

Thom M. Thompson
Manager
Government and Public Affairs

c: Honourable Jack Davis
J.C. Edwards

BCHydro

proud of our Service

1 June 1990

Dear Mayor:

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T. THOMPSON

Thom M. Thompson
Manager
Government and Public Affairs

c Honourable Jack Davis
J.C. Edwards

BCHydro

proud of our Service

1 June 1990

ear Regional Municipality of Whistler:

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ednesday	6 June	* Conference Centre Whistler Way, Whistler
hursday	7 June	* Pemberton Senior Secondary School Pemberton Meadows Road, Pemberton
londay	11 June	* Clinton Community Hall 306 LaBourdais Avenue, Clinton
uesday	12 June	* Bridge River School Mission Mountain Road, Seton Portage/Shalalth
ednesday	13 June	* Legion Hall 737 Main Street, Lillooet

I will continue to keep you apprised of the status of this project. Should you have any questions please contact myself (collect) at [redacted]-2653 or Jack Edwards, our Manager of External Relations (collect) at 663-[redacted]5.

Yours truly,

ORIGINAL SIGNED BY
T. THOMPSON

Thom M. Thompson
Manager
Government and Public Affairs

c Honourable Jack Davis
J.C. Edwards

B.C. Hydro

25 July 1989

File: 5L46-1400

Dear Regional Municipality of Whistler:

I would like to thank the members of your council for the opportunity to present our plans for the proposed Kelly Lake to Cheekye 500 kV transmission line at your council meeting of 26 June 1989.

I have enclosed a package of published material on the subject of electric and magnetic field effects of transmission lines. Should you require further information after your review of this material, please let us know.

Thank you once again for meeting with our project team. We look forward to you involvement in the design and implementation of our consultation program for the Kelly Lake-Cheekye project. If you have any further question or concerns, do not hesitate to contact myself at 663-4014 or Mary Algar, our External Relations Coordinator, at 663-3796.

Yours very truly,

J. (Jeff) Barker, P.Eng.
Project Manager

JB/wpc
Enclosures

VL195

BCHydro

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J.C. Edwards
Manager, External Relations
(604) 663-3795
Fax (604) 663-3323

30 July 1990

Mr. Peter Ostergaard
Manager of Regulated Projects
Energy Policy Branch
Ministry of Energy, Mines
and Petroleum Resources
Room #401
617 Government Street
Victoria, B.C.
V8V 1X4

Dear Mr. Ostergaard:

Re: Kelly Lake - Cheekye 500 kV Transmission Line

Enclosed are 50 copies of each of the following:

*Kelly Lake-Cheekye A Planning Perspective.....Mar 1990

*Kelly Lake-Cheekye 500 kV Transmission Line
Project Newsletter No.2 .....May 1990

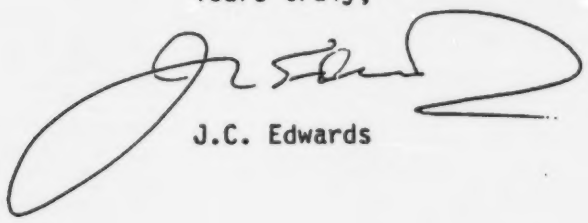
*Preliminary Planning Report. Kelly Lake to Cheekye
Substation Second 500kV Transmission Line.....May 1990

We understand that you will coordinate the distribution of these documents to other government agencies as appropriate for their information and comments.

After the agencies have had an opportunity to review the foregoing information, we would appreciate receiving their comments. To facilitate their review we would be pleased to meet with you and interested members of the agencies to discuss the contents of the above documents and to present an update on the status of the environmental and technical route studies and the public consultation which have occurred since the documents were proposed.

Additional copies of the information can be provided on request to either, the Project Manager, Mr. Jeff Barker (663-4014), or myself.

Yours truly,



J.C. Edwards

Encl.

c: J. Barker

BCHydro

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7 November 1990

Dear Resident/Property Owner:

Kelly Lake-Cheekye 500 kV Transmission Line Project

Over the last year or so, B.C. Hydro has been reviewing routing options for the proposed 500 kV transmission line between Kelly Lake, near Clinton, and Cheekye substation, near Squamish. You are on our mailing list as a result of your interest in the transmission line routing through the Cheakamus Valley.

At a meeting held at the Brackendale Art Gallery last June and attended by a number of residents of the upper Cheakamus, we presented routing options in the Cheakamus area, including a newly identified route located east of Highway 99, known as the "High Cheakamus" route. We offered at that meeting to advise interested individuals of B.C. Hydro's routing plans in the Cheakamus area after a thorough review of the High Cheakamus route.

We have carried out environmental and technical studies of this route. I can now advise you that the generally favoured routing in this region is the High Cheakamus route (see attached map). This information will be reflected in our upcoming application for an Energy Project Certificate which will be submitted to the Minister of Energy, Mines and Petroleum Resources.

Should the High Cheakamus route be approved by the regulatory agencies, B.C. Hydro will review both the removal of the existing transmission line in the valley (2L1) and the release of its right-of-way.

2-E54.L

British Columbia Hydro and Power Authority, 970 Burrard Street, Vancouver B.C. Canada V6Z 1Y3

At our meeting in June we also offered to meet again in the fall to share the results of the environmental and technical studies. If you are still interested in a meeting or open house to review these studies or other aspects of the project, please call Kevin Graeme, our Project Consultation Officer, (collect) at 663-3414 or Jeff Barker at 663-4014. We will arrange a meeting if sufficient interest exists.

Yours truly,

J.C. Edwards
Manager
External Relations

Attachment

c: J. Barker
K. Graeme

FERDINAND U. VONDRUSKA 2410 RUSSET PLACE, WEST VANCOUVER, B.C. V7V 3B6 926-1544

Lot 8 & 7, Midnight Way, Upper Checkamus, BC

J00290af.2b

Vancouver April 2nd, 1990

BC Hydro
Mrs. Mary R. Algar
Community Relations Coordinator
970 Burrard Street
18th Floor
Vancouver, BC
V6Z 1&3

Dear Mrs. Algar,

Attached please find copies of signatures of our petition addressed regarding the proposed Kelly Lake - Cheekey Transmission Line.

I was informed that Hydro intended to meet with representatives of those communities that are affected by the Kelly Lake - Cheekey Transmission Line. It was indicated that such a meeting was planned for March (in Pemberton). We did not receive an invitation!

Residents of Paradise Valley are greatly concerned that their voices be heared and confirmed.

I am looking forward to hearing from you and remain,

Yours truly,

F. Vondruska

Ferdinand Vondruska

cc. Mr. Jerry Baker, Housing Administrator, North Vancouver, BC
Mayor Philip Turner, District of Squamish
Alderman Brian D. Giles, District of Squamish
Mr. Peter Scott & Associates Ltd., Vancouver
Mr. Dan Cumming, Minicipal Finance Authority of BC, Britannia

FERDINAND U. VONDRUSKA 2410 RUSSET PLACE, WEST VANCOUVER, B.C. V7V 3B6 926-1544

050490df.2b

Vancouver May 4th, 1990

Mr. K. C. Graeme &
Mr. B. A. Hooper
Public Relations Office
970 Burrard Street
18th Floor
Vancouver, BC
V6Z 1Y3

Gentlemen,

Thank you for your visit to my office Wednesday, May 2nd, 1990.

It was agreed that we will hold an information meeting during which both sides (BC Hydro -BCH- and F. Vondruska, representing the Upper Cheakamus residents group - UCR) will submit their views and concerns regarding the planned 500kV power line from Kelly Lake to the Cheekye distributor station.

A number of residents of the UCR make it clear that they cannot live within the proximity of a 500kV power line. Their well being is already greatly compromised by the present 230kV power line: ie. they receive electric shocks when working inside or outside their dwellings.

We did not discuss the 'toxicity' of the EMF effect in detail since neither the members of the UCR, nor Mssrs. Hooper and Graeme are EMF specialists. But UCR wanted BCH to know that none of the UCR members take the possible negative effects of strong EMF on their health lightly. The members of the UCR group ask that BCH sincerely help them prevent a possible negative effect on their health. As a consequence of the aforesaid: No 500kV power line through the immediate vicinity of the Upper Cheakamus valley.

We also discussed the easement and width of the present power line and it was stated by BCH that a 500kV line would definitely need further clearing and widening, although such an easement may be moved somewhat further away from present dwellings.

The UCR recommended that a 500kV line be combined with those that already exist high above the valley bottom and parallel the Whistler Highway.

The UCR indicated that some of its members are extremely upset about the fact that they were not informed about the potential construction of a 500kV line when they bought their land (FROM BC

DRO in 1984, 1985, 1986 respectively!). Already in the Seven-ies and definitely in the Eighties, BCH had detailed plans on a 0kV line traversing Paradise Valley. Some UCR members make it ear that they would not have bought their land in Paradise alley if they had known that fact! They will reserve the right ask for compensation i.e. diminished value of real estate.

CH indicated that a 500kV line placed high above the valley ottom paralleling the Whistler Highway may constitute an eye-e. (An eyesore to whom, we ask?) All the members of the UCR e either walked or driven the route to Whistler (above Para-ise Valley) and agree that the widening of Whistler Highway to r lanes (above Paradise Valley) represents a much greater esore than a few additional hydro towers. Therefore, a power ine high above the valley bottom would not make much of a fference. It should be remembered that most tourists and skiers ving to and from Whistler do no not look upwards (which would at the ceiling of their cars in any event) but down into aradise Valley and at the Tantalus Range. A widening of the sent power line corridor through Paradise Valley and the dding with 36 - 59 m spans, will desecrate a peaceful valley nd panorama. In addition, the members of UCR point out that it ld be very unwise to bring a new 500kV power line along the side of the valley and hills, which is on the right hand side f the valley looking downstream. Incidentally, such a line would e to cross the land of the First Nation.

he UCR understands that the present pylons (structure) date back 1947 and will have to be replaced in any event.

he UCR indicated that the responsible heads of the First Nation re not in agreement with the present nor a widening of a BC ro easement over their land.

he UCR has indicated that Paradise Valley now has to absorb an reasing amount of pollution from various sources:

- polluted river water from Whistler;
- spraying of RR track by BC Rail,
- noise of low-flying helicopters,
- widening of Whistler Highway, blasting
- increased traffic on Whistler Highway
- increased traffic on BC Rail line
- RR accidents (recently one in the canyon with sulfur)
- threat of a widening of BC Hydro power line easement and an increase of power to 500kV

t is also for this reason that the UCR asks BCH to reroute its 0kV power line.

e UCR indicated that, in good years, and during the course of a r, an average of 4 - 5 families move into the Upper Cheakamus a. A 500kV power line would make it very much more difficult o build relatively low cost housing in this valley due to the effect and BCH's right-of-way restrictions. On November 21st,

1989 (at 7:30pm) this concern was brought to Squamish City council for consideration. And since it will not be possible to build up the area to its potential (if a 500kV line traverses the valley) Squamish may not be able and willing to provide present and future residents with adequate services! (due to a reduced tax basis!)

The UCR was pleased to hear that the old Bennett days, when BCH was an uncontrollable powerhouse, are over. BCH is now greatly concerned about the wellbeing of the citizens of BC and our concerns are being studied in detail with appropriate actions to follow.

It was indicated that the theoretical EMF effect of the present 230kV line (calculated by engineers of BCH) is in the process of being double checked at two points in the valley. A realistic picture of a (possible) 500kV EMF effect through the valley is being developed by BCH.

It was mentioned that BCH wishes the new 500kV line to be finished by the year 1995 and that BCH will have to start with the clearing work etc. not later than spring 1992. Time is slowly running out, yet, contracts have not been signed!

The BCH group stressed time and again that health, beauty and development considerations must be given careful considerations before the new 500kV line is pushed through Paradise Valley.

It was indicated that a power line high above the valley bottom would be considerably more expensive but BCH has indicated that the health of BC citizens is more important than an electric cable running East - West.

I am looking forward to hearing from you and remain,

Yours truly,

F. Lindemann

cc
First Nations, Mr. Jerry Baker, North Vancouver & Squamish BC
Mayor Philip Turner, District of Squamish
Alderman Brian D. Giles, District of Squamish
Mr. Peter Scott & Associates, Electrical Engineers, White Rock BC
Mr. Dan Cumming, Municipal Finance Authority of BC, Britannia BC
Mr. Helmuth Scherer, Upper Cheakamus, BC
Mrs. Yolanda Destradi, Upper Cheakamus, BC

Abridged version to: 47 Upper Cheakamus residents

BC hydro

proud of our Service

J.C. Edwards
Manager, External Relations
(604) 663-3795
FAX (604)663-3323

1 June 1990

Mr. Ferdinand Vondruska
2410 Russet Place
West Vancouver, B.C.
V7V 3B6

Dear Mr. Vondruska:

Re: Kelly Lake - Cheekye 500 kV Transmission Line Project

Thank you for your letters dated 02 and 09 April 1990 and your 02 May 1990 meeting with members of our project team, Kevin Graeme and Bryan Hooper, which identified your concerns regarding the above noted project. We have recently completed the process of synthesizing the results of our environmental and technical route studies to date. Those results have been summarized in a project newsletter which I am enclosing for your review. This newsletter has been distributed to all households in the study area in advance of the upcoming Open Houses. The dates and locations of these Open Houses have been advertised locally (schedule enclosed).

As you are aware from the above noted meeting, the opinions of local residents expressed at the Brackendale Open House, together with subsequent correspondence has resulted in the identification and preliminary analysis of sub-options for transmission line route alternatives in the Lower Cheakamus Valley. These include an option on the west side of the valley, another on the east and a third to the east of the southern portion of the valley, referred to by B.C. Hydro as the southern option, which bypasses the North Vancouver Outdoor School and the Cheakamus Indian reserve.

Further discussion and studies are required in an effort to arrive at a route which hopefully will have broad consensus from a public consultation, technical, and cost point of view.

If you have further questions they can be addressed at our scheduled meeting which follows the conclusion of the 04 June 1990 Brackendale Open House. If you have any questions please call me at 663-3795 (collect) or our project public consultation officer, Kevin Graeme at 663-3414 (collect). Thank you for your interest and involvement in the public consultation process.

Yours truly,

Mary Algar per
J.C. Edwards

c. B. Hooper
K. Graeme
Mr. Dan Cumming, Chairman, Squamish Lillooet Regional District
Mayor Philip Turner, District of Squamish
Mr. Brian Giles, Alderman, District of Squamish
Peter Scott and Associates Ltd., Vancouver
Mr. Helmut Scherer, Upper Cheakamus
Mr. Jerry Baker, Housing Administrator, North Vancouver

Kelly Lake – Cheekye Transmission Line Project

Phase 2 – Open Houses

BC Hydro is continuing to study a second 500 kV transmission line from Kelly Lake Substation near Clinton to Cheekye Substation near Squamish, B.C.

We would like to invite you to drop by and review updated project information at an Open House. Project representatives from BC Hydro will again be available to answer your questions. Light refreshments will be served. We encourage your participation in this project and appreciate your continued interest. The Open Houses will be held from 4 to 8 p.m. in the following locations:

Mon	June 4	•Brackendale Art Gallery Government Road, Squamish
Tues	June 5	•Birkenhead Lodge Portage Road, Birken
Wed	June 6	•Conference Centre Whistler Way, Whistler
Thurs	June 7	•Pemberton Sr. Sec. School Pemberton Meadows Road, Pemberton
Mon	June 11	•Clinton Community Hall 306 LaBourdais Avenue, Clinton
Tues	June 12	•Bridge River School Mission Mountain Road, Seton Portage/Shalalth
Wed	June 13	•Legion Hall 737 Main Street, Lillooet

P.O. Box 399
Brackendale, B.C.
VON 1HO

28 June 1990

Mr. K. Graeme
Project Public Consultation Officer
Kelly Lake - Cheekye 500KV Transmission Line Project
B.C. Hydro and Power Authority
970 Burrard Street
Vancouver, B.C.
V6Z 1Y3

Dear Mr. Graeme:

The public information meeting held at the Brackendale Gallery on June 4 was indeed informative and well programmed. We appreciate the time and effort that was taken to explain your company's plan to replace the existing 230KV power line, which runs near our homes, with a 500KV line. We were pleased that, in view of concerns expressed by local residents at previous meeting, you have begun to look at alternatives to bypass the Upper Cheakamus area.

We are a small community of individuals who have moved into the area because of the peace and tranquility offered in this rural setting. We are categorically opposed to any proposal to run the new 500KV line in the Paradise Valley and Midnight Way areas of the Upper Cheakamus. We have no doubts whatsoever that the more affluent and popular area around the resort village of Whistler will have its concerns met and that the new line will bypass that community. We urge you to accommodate our concerns as well, by building the new line east of Highway 99, as outlined at the June 4 meeting.

The proposed new right of way, above the Whistler Highway, is in an unpopulated area and is the least disruptive to local residents.

We, the undersigned, are opposed to the new line being built in the Upper Cheakamus and urge you to build it east of Highway 99.

Yours truly,

Name	Address	Telephone No.

..../2

Name	Address	Telephone No.

cc: Hon. William Vander Zalm
Premier of British Columbia

Hon. John Reynolds
Minister of the Environment

Hon. Claude H. Richmond
Minister of Forests

Hon. Jack Davis
Minister of Energy, Mines & Petroleum Resources

P. Taylor
Mayor of Squamish

B.C. Hydro & Power Authority
Squamish, B.C.

B.C. Utilities Commission
800 Smithe Street
Vancouver, B.C.

BChydro

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15 August 1990

Dear Kelly Lake-Cheekye Project - Petition (see list attached)

Kelly Lake-Cheekye 500 kV Transmission Line Project

Thank you for your letter of 28 June 1990 in which you and your neighbours expressed your opposition to the proposed Kelly Lake-Cheekye 500 kV transmission line in the Paradise Valley and Midnight Way areas of the Upper Cheakamus Valley. As discussed at the meeting held following the Open House in Brackendale on 4 June, we are currently investigating routing and design alternatives for this area. This will require additional environmental and technical studies on a tentative route identified as the "High Easterly" or "High Cheakamus" option on the attached map.

We hope to complete these studies early this fall and would like to review these results in a meeting with the Upper Cheakamus residents at that time.

In the interim, we have added your name to our mailing list so that we can keep you updated with our study activities. We appreciate your interest in the project and your support of our public consultation efforts and look forward to your continued involvement in our project planning.

If you have any further questions or comments, please call our Project Public Consultation Officer, Kevin Graeme, at 663-3414 or call our toll free project information line at 1-800-663-1377.

Yours truly,

J.C. Edwards
Manager
External Relations

Attachment

c: Honourable Jack Davis
Kevin Graeme

2-Y47.L

KELLY LAKE - CHEEKYE

Project Related	No. PIR's
1. Routing	*27
a. Favoured Route (existing)	5
b. Alternative Routes	1
c. Release of 2L1 ROW	0
2. Property Impacts	*25
3. Justification/Need	*27
4. Local/Economic Benefits	*13
5. Taxation	1
6. Construction Impacts	*7
7. Project Design (ie.Tower design)	8
Corporate Planning	
8. Electricity Plan (includes long range planning/Resource Plan)	6
9. Undergrounding	0
Corporate	
10. B.C. Hydro/Public Relationship	*38
11. Public Safety	1
Environmental	
12. Air Quality	0
13. Aquatic Resources	1
14. EMFs	*36
15. Global Warming	0
16. Mitigation, Compensation and Enhancement	0
17. PCB Management	2
18. Pole Treatment Chemicals	0
19. Solid Waste Management	1
20. Vegetation Management	11
21. Aesthetics/Visual	2
34. Water Supply	1
35. Recreational Management	2
36. Wildlife Management	2

Utility Market Issues	No. PIR'S
22. Electricity Rates	0
23. Export	*8
24. IPPs (Meager Creek)	3
25. Lifeline Rates	0
26. Wheeling	0
37. Energy Conservation/ Power Smart	5
Utility Management	
27. Crisis Management	0
28. Electric System Reliability	5
29. Magnetic Storms	0
Technology Issues	
30. Electric Vehicles	0
31. Photovoltaics	0
Sociocultural	
32. Native Peoples	0
33. Not In My Back Yard	0

* Note:
These figures are based on approximately 270 of the PIR's received from November '89 to September'90, closed as of October '90. Eight of the PIR's have multiple issues assigned.

Numbers 34. - 37. are additional categories that were deemed necessary.

* Indicate revised numbers since 9/Oct/90 draft

PC File: C:\WP51\DOCS\KCISSUES.NOS

List of Interest Groups Contacted

The following interest groups were contacted during Phases 1 and 2 of the Kelly Lake–Cheekye consultation process:

1. B.C. Wildlife Federation
2. Federation of Mountain Clubs of B.C.
3. Outdoor Recreation Council of B.C.
4. Federation of B.C. Naturalists
5. Birkenhead Lake Estates
6. North Vancouver Outdoor School
7. Signal Hill Elementary School Parents Group
8. Lower Cheakamus Residents
9. Pemberton Sportsmen's Wildlife Association
10. Yalakom Residents Group
11. Seton/Shalalth Chamber of Commerce